WESTERN GAS

November 1930

20 Cents the Copy

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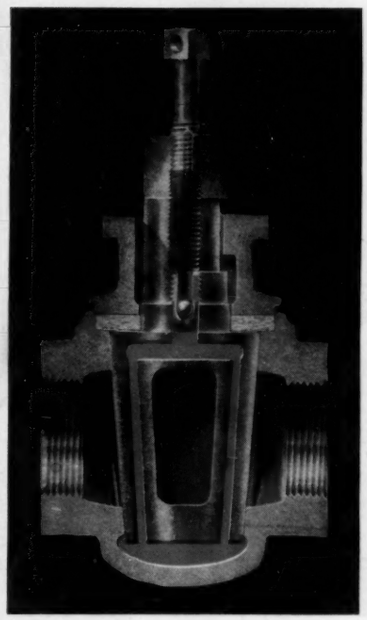

THE PERFECT APPLICATION OF A PRINCIPLE

Prevention of valve leakage is effectively accomplished by high pressure lubrication under the Nordstrom principle. A force several times that of the line pressure is applied to introduce viscous "Merco" lubricant into every pathway of possible leakage, thereby sealing the valve. At the same time pressure lubrication performs the other functions of a hydraulic jack when necessary to loosen the plug when stuck, and reduces the coefficient of friction on sliding metal surfaces held together under high pressure. It is quite apparent that the Nordstrom principle is superior to gate valve or non-lubricated action.

For unfailing service use genuine "Merco" Lubricants

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A MONTHLY JOURNAL DEVOTED TO THE WESTERN GAS & APPLIANCE INDUSTRIES

One-piece Ironcase Casting

Eliminates the possibility of Internal Case Leaks

OF GREAT IMPORTANCE to the accuracy of any displacement meter is the construction of the case. In Metric Ironcase Meters, the valve table, partition and channels are cast as an integral part of the body. There can be no internal leakage between measuring compartments.

Even a minor internal leak can make a meter incapable of measuring a pilot light load. For that reason, all meters are given a rigid low fire test before leaving our factory. And the test record of Metric Ironcase Meters with their leak-proof one-piece bodies, proves convincingly the value of this important structural improvement.

The one-piece principle of Metric construction is illustrated by the cross-sectional view of the 5-B body casting. This advantage is available in every Ironcase meter which includes 5-B, 10-B, 20-B, 25-B, 30-B, 35-B, 60-B, 80-B, 250-B, and 500-B.

Write for our Ironcase Catalog EG-40.

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METRIC METAL WORKS
ERIE, PENNSYLVANIA
IRONCASE, TINNED STEEL CASE and ORIFICE METERS

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The World's Largest Manufacturers of Gas Meters and Allied Apparatus
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S. R. Dresser Manufacturing Co.
Bradford **Pennsylvania**

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Pipe, Smith Field Welding is company or to its contractors. SMITH Welded Pipe and Smith has secured the best results in combination also brings speed and, correspondingly, brings invested in its construction.

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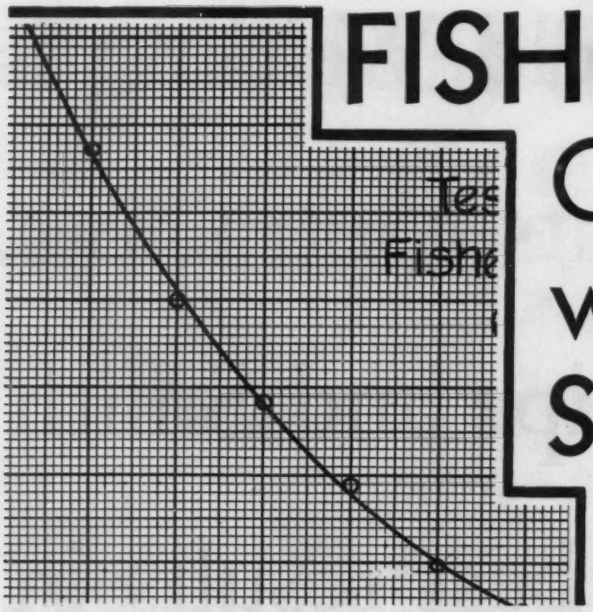
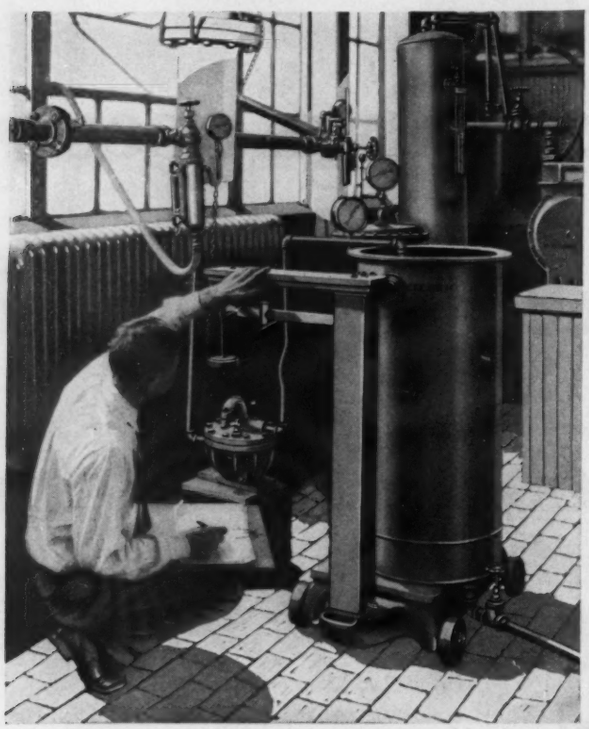
GAS LINE PIPE



FISHER Capacity Charts show where you can SAVE money



AN ENGINEER who uses many types of fluid control specialties told us this: "Since I have been using your capacity charts, I have discovered that the pressure governors, liquid level controllers, etc., I previously installed were all considerably oversize. Whenever I specified a specialty, I always stepped it up a size, because I knew the rated capacities were just estimates and I wanted to be sure it would be large enough.

"Now that I have these charts I am saving considerable money by specifying the smaller sizes that your tests prove will do the job." He might have added that more accurate control and longer life are also assured when the valve is working close to capacity.

Fisher Capacity Charts are taken from comprehensive scientific tests of each size and type of valve—they have nothing to do with the usual theoretical estimated capacities. The charts for steam, air, gas and liquids will now be gladly sent upon request to users of Fisher Specialties; they, of course, are applicable only to Fisher Specialties.

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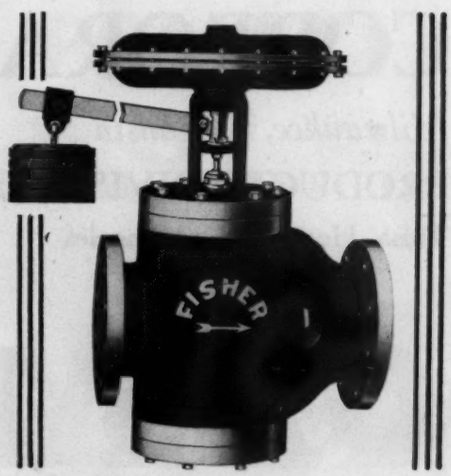
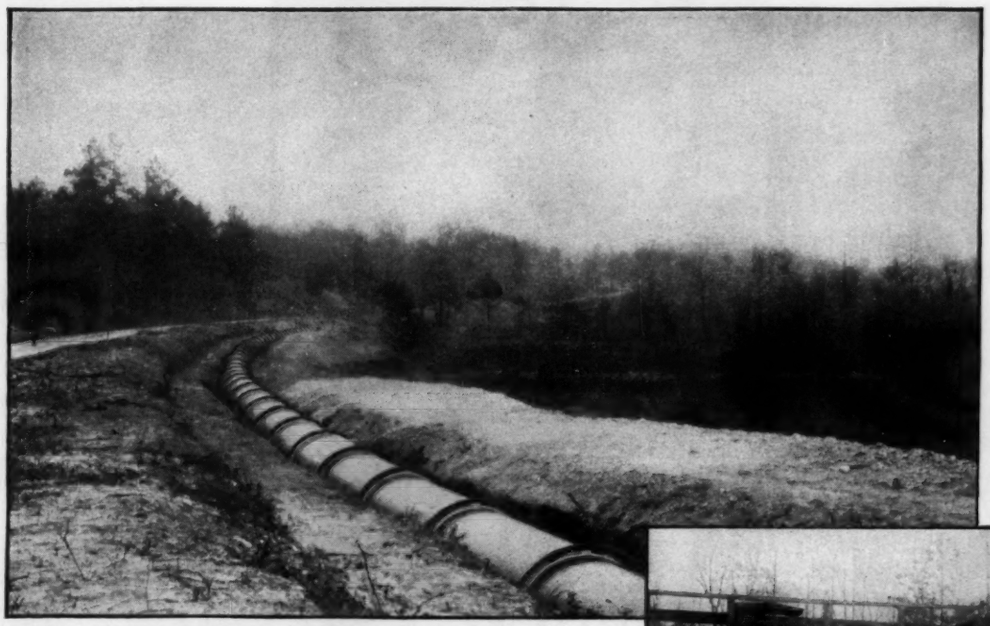
THE MARK OF SCIENTIFIC FLUID CONTROL

The Type 590 Fisher Gas Pressure Regulator or Reducing Valve is primarily for low pressure service. The streamline valve body (an exclusive Fisher development) makes this regulator particularly desirable when extremely large capacity and low friction loss are required. Gas pressure of a few ounces is maintained regardless of normal pressure pulsations on inlet side.





48" U. S. Cast Iron Pipe line rounding a curve in Chattahoochee Avenue, Atlanta, Georgia.

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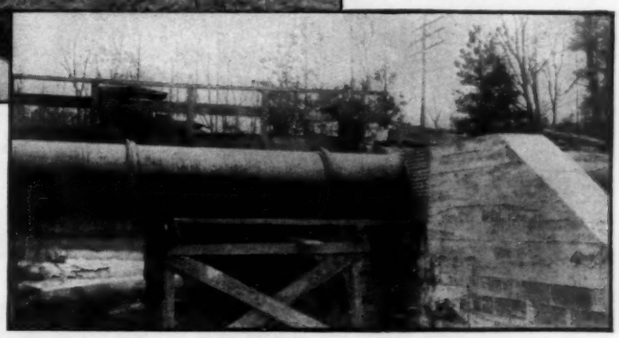
Large diameter U. S. Pipe crossing Woodall Creek, Atlanta, Georgia.



This large diameter CAST IRON MAIN

is saving money for Atlanta, Georgia

WHEN it came to a question of what kind of pipe to use for Atlanta's new and costly water supply line, U. S. Cast Iron Pipe was the final answer. The city officials and engineers agreed upon large cast iron pipe because of its proved durability. Here, they reasoned, is the kind of pipe that will last for centuries—has lasted for centuries. So they specified cast iron for this important main and saved the city the cost of needless replacements and repairs . . . This was in 1923.

Today, the splendid condition of this main is proving the wisdom of their judgment. After 7 years the line is 100% efficient. In fact, the 7-year period since its installation is looked upon as only a small fraction of the years of constant service which are still ahead.

Large diameter United States cast iron pipe is today adequately and economically serving many hundreds of cities and towns in every part of the country. U. S. Pipe is carefully inspected for quality and uniformity. Its joints are always tight and dependable. And, it has an extremely high resistance to rust and corrosion.

Let us tell you more concerning the advisability of specifying United States Cast Iron Pipe. Also inquire about deLavaud pipe—the pipe which is centrifugally cast for greater strength and carrying capacity.

United States Pipe and Foundry Co., Burlington, N.J.

Our pipe bears the "Q-Check" trademark of The Cast Iron Pipe Research Association

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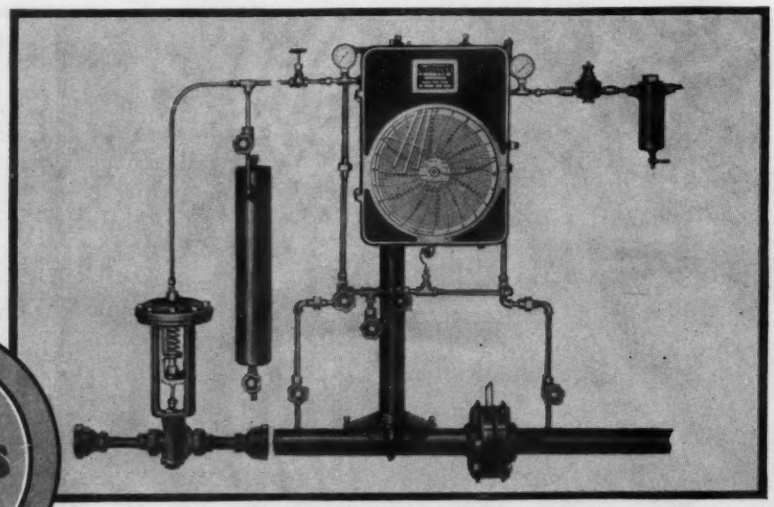

A DOZEN APPLICATIONS

Indicate the Wide Range of Important Uses

THE Metric Rate Volume Controller makes the constant control of volume as certain and as satisfactory as the constant control of pressure has already been made by the use of high-type regulators.

A new application of the controller is the proportional control of two gases, or a gas and a liquid. The Metric Rate Volume Controller also fills a need for controlling the percentage volume of one liquid relative to the other.

A dozen applications in oil and gasoline processes indicate the wide possibilities for use in other fields.

REFINERY APPLICATIONS

Controlling rate of oil charged to each crude distillation unit, to each cracking unit, or to each steam still. Controlling amount of steam used in steam still. Controlling rate of crude medium to each tower. Individual volume control of acid or caustic flow in connection with "continuous treaters," for light distillate such as gasoline.

NATURAL GASOLINE PLANT USES

Controlling rate of flow of absorption oil sent to the absorbers, gas sent to the absorbers, oil to the still, lean oil from the still, steam to the still, or oil charge to kettle in gasoline stabilization.

Write us for the specific data you need.

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MADE BY WALWORTH (PATENTED)

- **Forged 1-piece bar and frame** *new*
- **Fewer parts** *new*
- **Easier action** *new*
- **Greater Strength**

Made especially to withstand hard use in gas service. To be manufactured in sizes 6 to 48 inches. Now available in 14, 18, 24 and 36-inch sizes.

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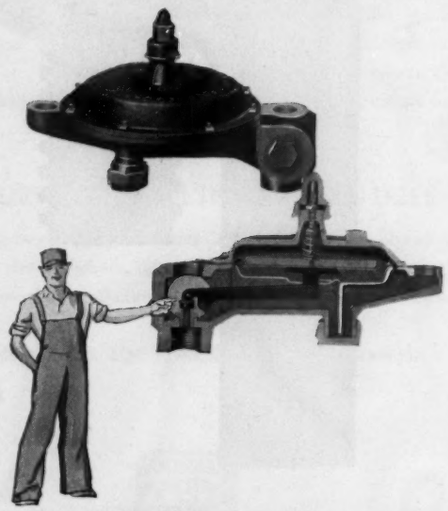
A regulator designed especially for domestic services that will operate under high or low pressure with natural or artificial gas.

The delivery pressure can be changed instantly while in service without shutting off the gas—all parts are interchangeable and accessible—repairs can be made without removing the regulator from the line. They can be furnished with spring or weight adjustment with or without mercury seals.

EMCO PRINCIPLES

Repairs can be made in the line
Removable valve and valve seat
All parts interchangeable



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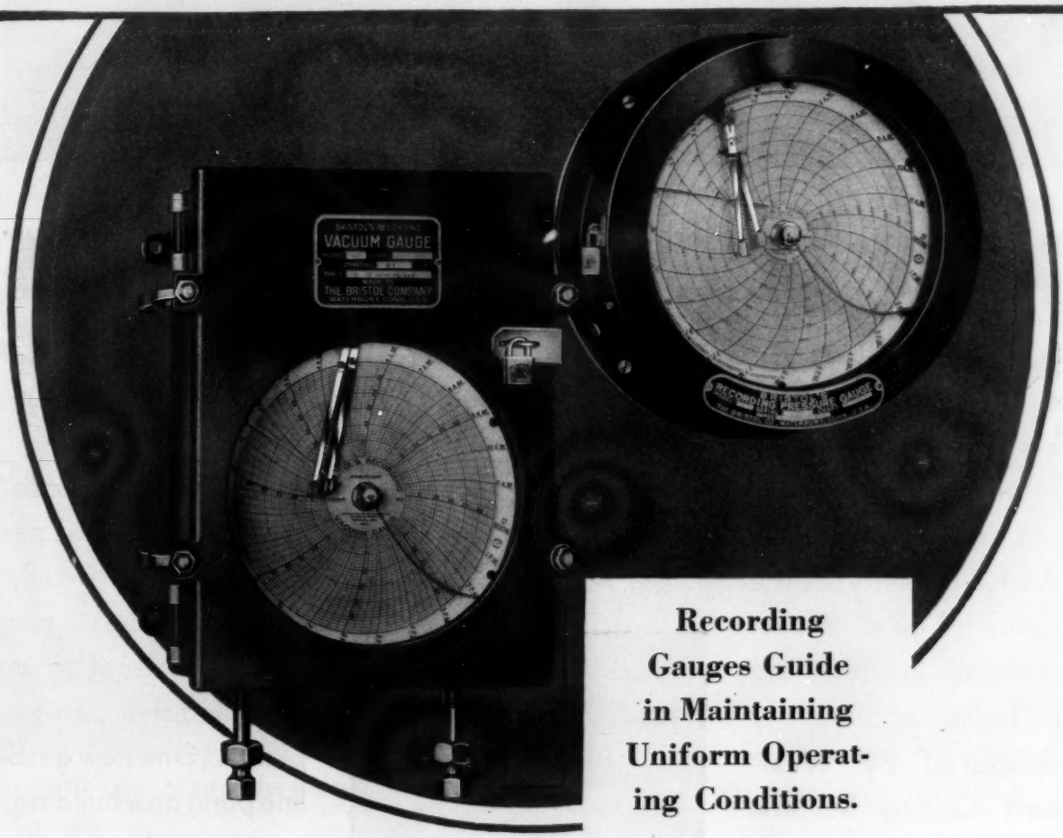

Recording Gauges Guide in Maintaining Uniform Operating Conditions.

Installed on incoming lines from the field, on city feeder lines; at compressor stations, or strategic points about the distribution system, Bristol's Recording Gauges give an exact, detailed check on system conditions. They enable operatives to determine at a glance, not only what the vacuum or pressure is at the instant of reading, but also what it has been during hours past, and the future trend. Also, as each chart is marked off in time arcs, the exact **time** and **extent** of all changes are clearly defined. Thus inefficiencies can be noted almost as soon as they occur and correction made before serious loss or trouble develops.

The two models of Bristol's Gauges illustrated are well suited to gas industry work. Case construction is dust-, fume- and moisture-proof. The inverted penarm arrangement is standard, assuring a clear, clean-cut record. Can be furnished for either wall or switchboard mounting or for portable use—

But get complete details—new Gauge Catalog No. 1009 will be sent immediately to any interested person in your plant. Write —

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Four offset wells at Kettleman Hills, (Calif.), one in each section.

KETTLEMAN HILLS

NATURAL Gas at a rate of 100,000,000 cu. ft. per day is being measured by Westcott Orifice Meters into pipe lines both to Northern and Southern California points. Also a majority of the wet gas and gasoline plant measurement in this field is being accurately measured by Westcott Orifice Meters.

Kettleman Hills wells are producing 25,500 bbls. daily (pro rated).

Gas delivered via pipe lines, 92,000,000 cu. ft. daily. Gas used in fields, approximately 4,000,000 cu. ft. daily. Total wet gas produced, 480,000,000. cu. ft.

Total natural gasoline produced, 385,000 gals. daily. Dry natural gas blown to air, 400,000,000 cu. ft. daily.

All of the above production is from seven wells and five gasoline plants. (One new gasoline plant now building.)

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Crosby Steam Gauge and Valve Co.
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Reliance Mfg. Co. **
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Sales Representatives
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Also a Complete Line of Laboratory Supplies

* California Field only.
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★

FIELD SERVICE

Westcott & Greis Engineers are available at all times to help you solve your measurement and control problems.

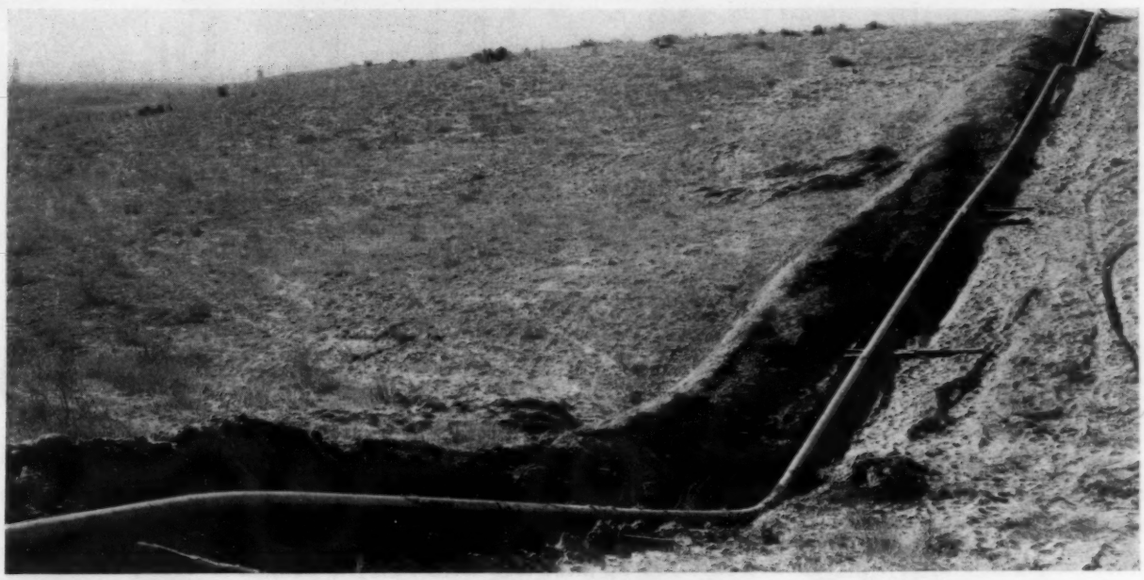
★ Follow our Story of Application of Measurement and Control Equipmen "From Field to Consumer" in future issues of Western Gas. ★

WESTCOTT & GREIS

MEASUREMENT AND CONTROL

LOS ANGELES TULSA HOUSTON DALLAS

A NEW PIPE MADE BY AN ENTIRELY NEW PROCESS



More than 2000 miles of Republic Electric Welded Pipe have been placed in the ground without a single leak, demonstrating the superiority of this new patented, resistance welded product.

Some Facts About "Republic" Electric Welded Pipe—

Resistance welded without the use of any welding rod or flux.
Uniformity of wall thickness and diameter.
Greater tensile strength.
Scale free inside and outside; less friction loss.
Guaranteed stronger weld than adjacent metal.
No low spots in wall of pipe.
Welding does not change structure of metal.
Can be bent, upset, swaged, van stoned, threaded or grooved for victaulic couplings.
Continuous lengths up to 50 feet in length.
Sizes 4 to 16 inches in diameter.

"A Product of Republic Steel Corporation"

For Stock or Mill Shipments Write

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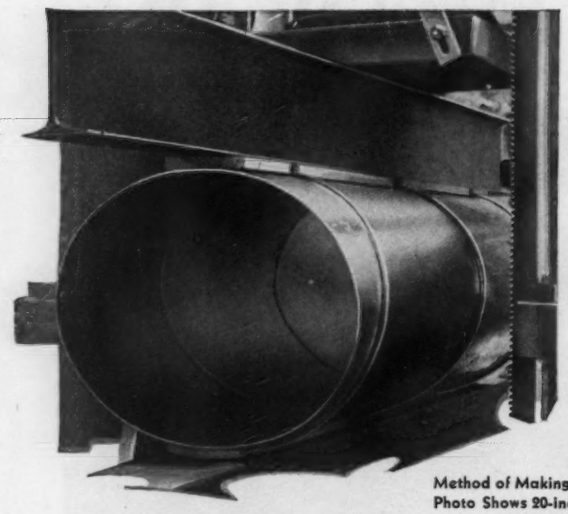
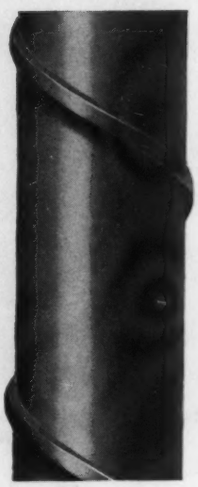


Method of Making Crushing Tests.
Photo Shows 20-inch Naylor Pipe.

Authoritative Tests Prove Remarkable Resistance To Crushing Action In LIGHT WEIGHT Naylor Pipe

External crushing tests on Naylor Pipe recently conducted by Proressor M. L. Enger and W. M. Lansford at the Materials Testing Laboratory of the University of Illinois show:

Diameter In.	Thickness In.	Load at Yield Point Lb. per Ft.	Vertical Defl. Yield Point In.	Max. Load Lb. per Ft.	Computed Load at Yield Point Without Spiral Joint Lb. per Ft.
6	0.109	4000	0.24	7100	1010
12	0.141	2800	0.45	4200	930
20	0.141	1000	0.45	2000	580



The last column in the table gives the computed load required to stress to the yield point a plain pipe of the same thickness as Naylor Pipe. A comparison of these values with the experimental values obtained on Naylor Pipe brings out clearly the stiffening effect of the Naylor *Spiralweld* lock-seam.

Another feature of Naylor Pipe structure disclosed by these tests is its ability to transmit loads at considerable distances along the length of the pipe due to the flexible *Spiralweld* lock-seam construction. As a result, loads applied to small areas of the pipe would have to reach relatively large values to bring about a collapse of the length which would be affected.

These authoritative tests are indisputable evidence that remarkable resistance to crushing action has always been one of the definite features of *light weight* Naylor Pipe. A fact that Naylor Pipe has demonstrated in the field. Catalog 30-2 gives more complete engineering and metallurgical data.

NAYLOR PIPE COMPANY, Main Office & Plant, 1230 E. 92nd St., CHICAGO

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TONCAN COPPER

Naylor Pipe

Maximum Structural Strength — Mo-lyb-den-um IRON — With Minimum Weight

Standardized Naylor Pipe is made in sizes 6" to 12" I. D. and 14" to 20" O. D. in any uniform length desired up to 40'0". Ends made to wrought pipe standards for all types of coupling.

Toncan Copper Molybdenum Iron possesses a superior corrosionresistance, making it the favored pipe material.

Where corrosion is not a problem, Naylor Pipe can be furnished in steel.

Now Under Construction
227 Mile Pipe Line
from Reading, Pa., to Syracuse, N. Y.
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SUSQUEHANNA PIPE LINE COMPANY
SUBSIDIARY OF SUN OIL COMPANY

Because of our experience, adequate use of the latest equipment, and our form of contract whereby 100% of all savings revert to the client—we are building pipe lines and gas distribution systems at low cost.

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MAXIMUM RETURN TO CLIENTS PER DOLLAR INVESTED

"For every joint on every line"

A FEW LEAKING JOINTS CAN CANCEL CONSTRUCTION ECONOMIES ON ANY PIPE LINE JOB.

For low cost installation — no leaks — no joint maintenance cost — SPECIFY VICTAULIC COUPLINGS

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Available in every size from ¾ inch up—for steel, wrought iron, cast iron and spiral weld pipe—any pressure. See Sweet's page 451. Mail the coupon below.

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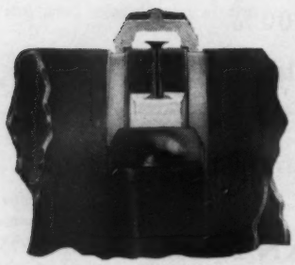

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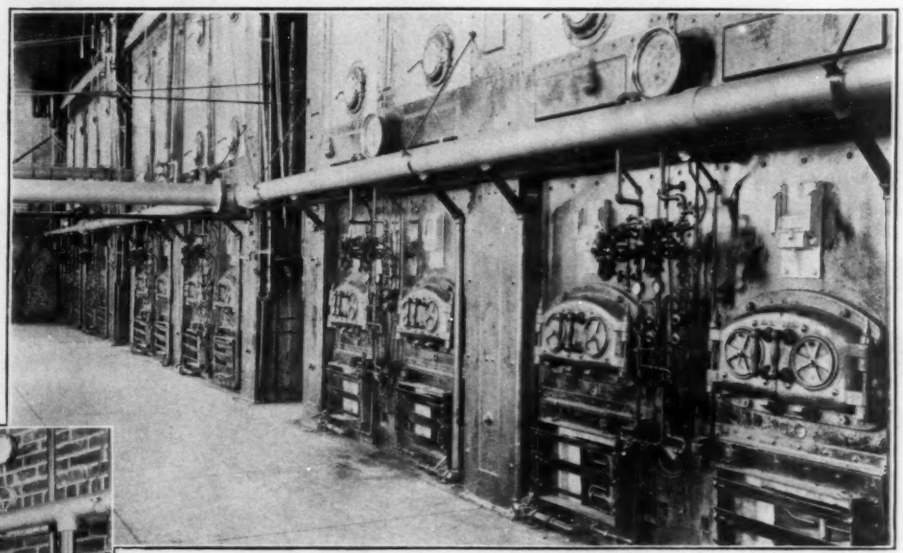
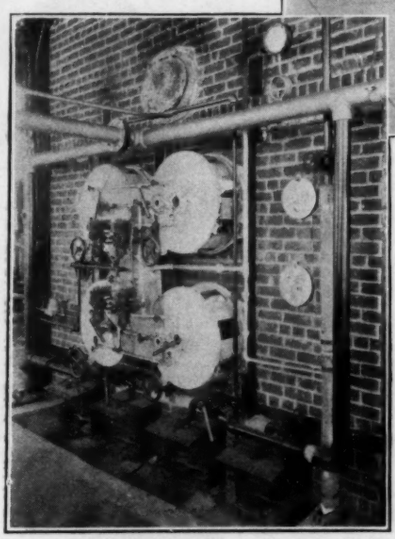
N. G. E. Burners fire *continuously* through a whole Beet Sugar campaign!

In this Tracy, California plant of the Holly Sugar Company, 30 N. G. E. Gas Burners Type A fire 6 Stirling boilers of 315 and 1 of 380 h. p. at 200 per cent rating — running continuously during the entire season.

Steam pressure at 140 lbs. is automatically maintained by a Wilgus 8 in. Pilot Actuated Gas Fuel Regulator.

In the pulp dryer shown below, having a capacity of 50,000 cubic feet per hour, 8 N. G. E. burners Type A under thermostatic control maintain a temperature of 2,200° F.





WHEN boilers are once fired at the start of the beet sugar season, they are never down during the entire campaign.

A year's manufacturing operations crowded into a few months of intensive, continuous work . . . a year's results at stake.

For this exacting service many of the leaders in the Western sugar industry have depended upon *N. G. E.* engineering co-operation in plant equipment, and *N. G. E.* gas burners and Wilgus Regulators for continuous, efficient service.

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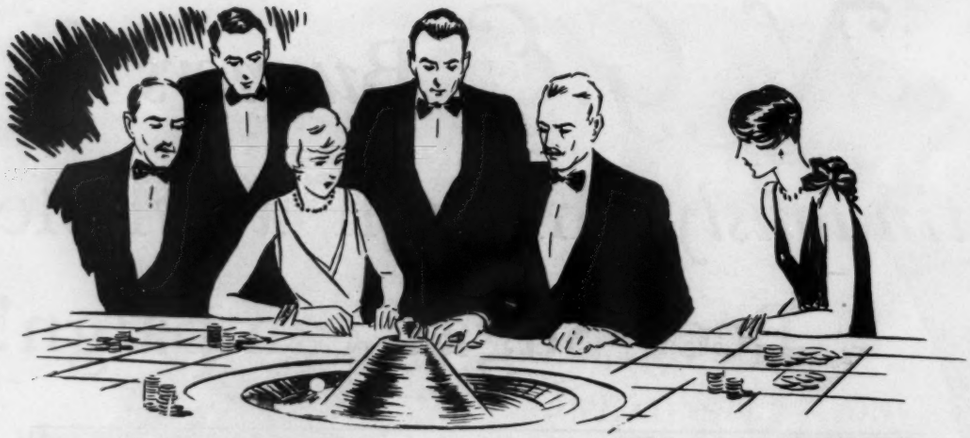


The law of averages stops the disc everywhere an equal number of times - -

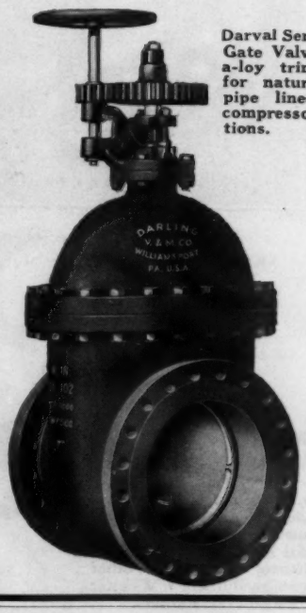
360° of Wearing Surface

NO ONE knows how the roulette wheel will stop next—(or at least they shouldn't know). But one thing is sure—over a long period of trials it will stop an equal number of times in every position.

And the law of averages distributes the stops on the Darling revolving gate discs in the same way. Every time the gate is closed the disc is in a different position—which affords a 360° wearing surface—hence—a greatly extended valve life.

But what really creates this true disc and seat contact is the perfectly plain interior construction, free from ribs and irregular shapes with no pockets for collecting scale and dirt that can cause the parts to stick and jam in operation.

The Darling Forged Steel Valves afford producers a safe valve where pressure is extremely high or unknown. The Darval Semi-steel valve provides long service for all general uses, both low and high pressures.



Darval Semi-Steel Gate Valve, Dar-a-loy trimmed—for natural gas pipe lines and compressor stations.

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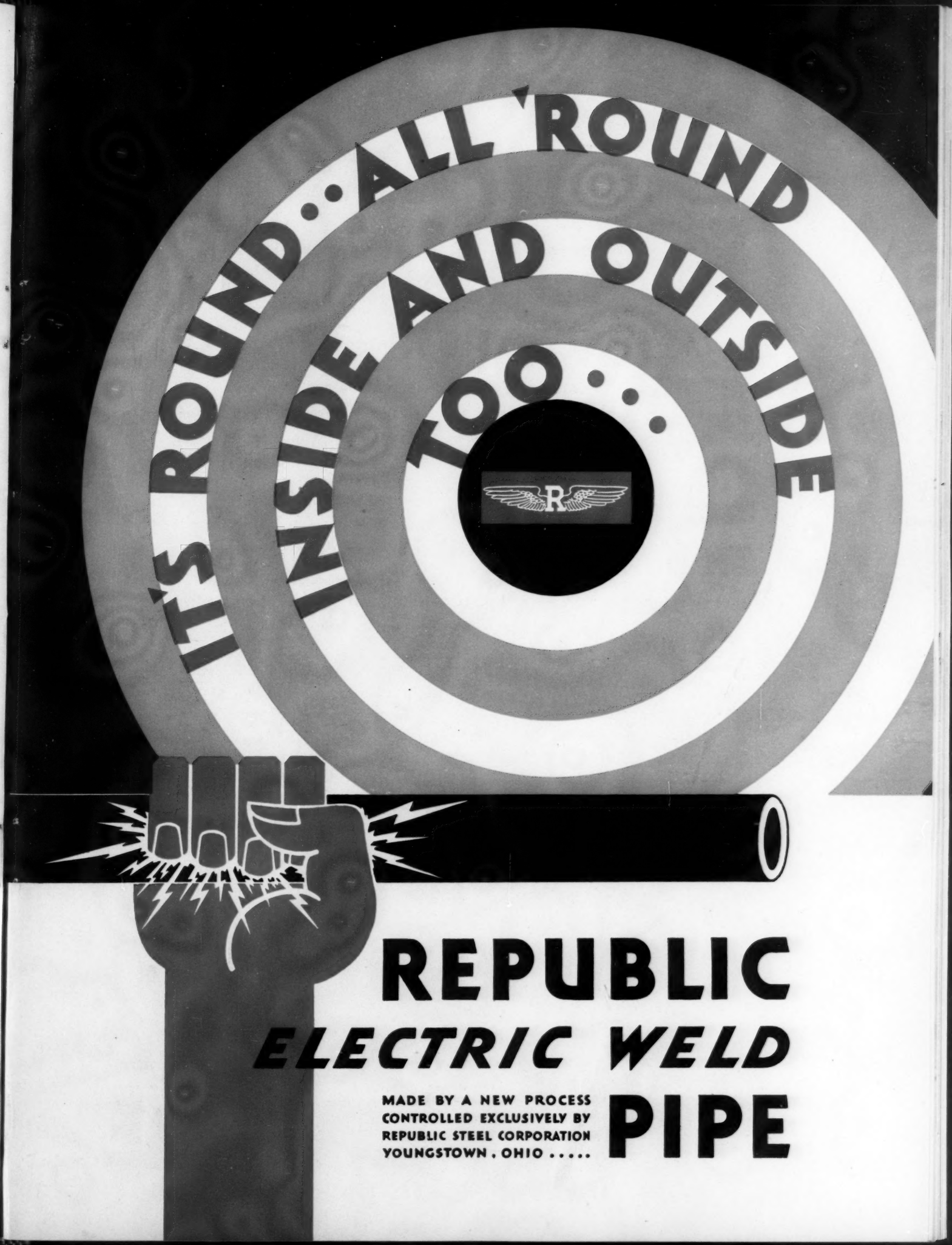
DARLING

GATE VALVES



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THE PIPE
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Perfectly round, inside and outside.
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Easy to weld and bend.
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REPUBLIC STEEL CORPORATION
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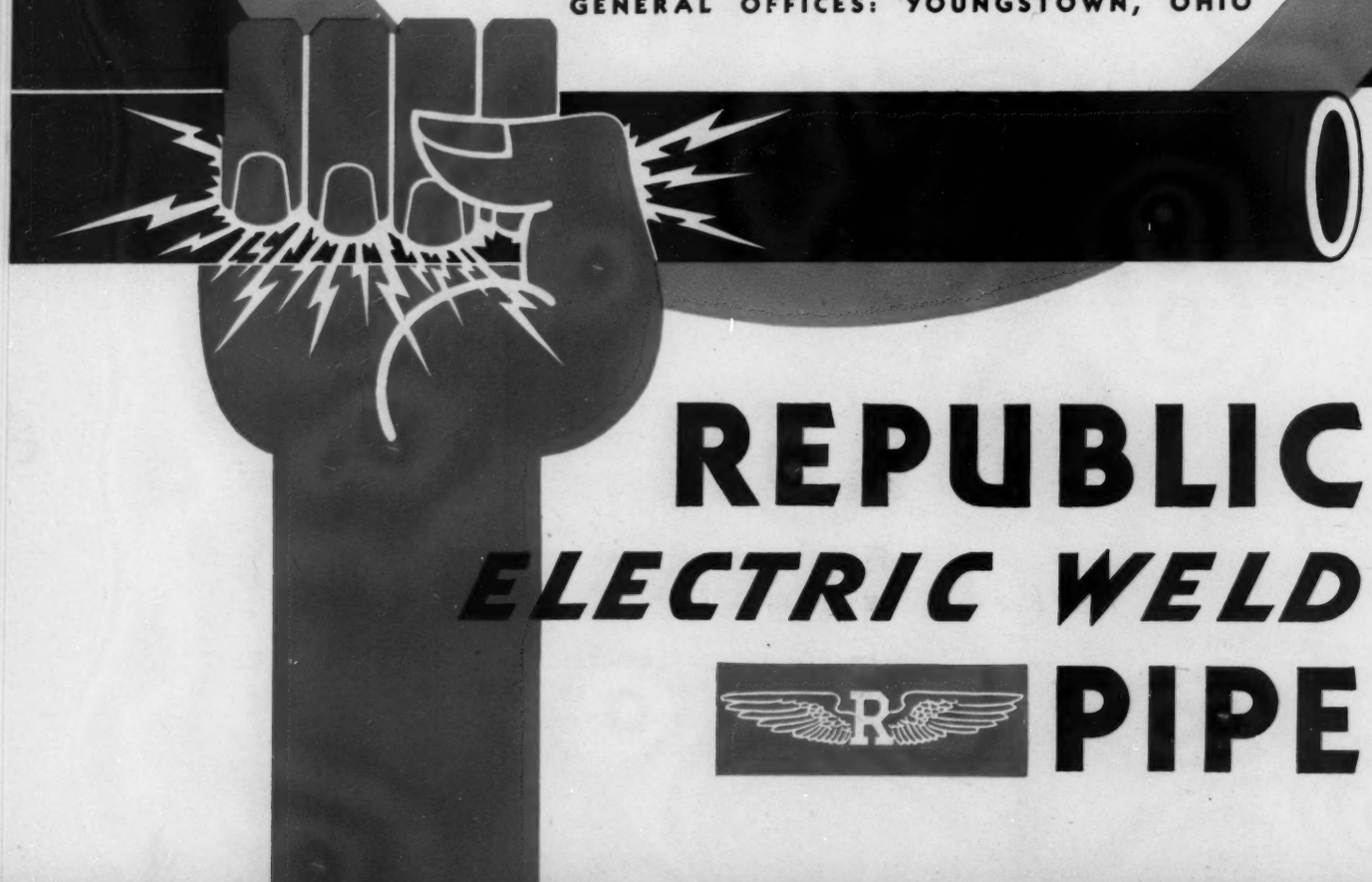

REPUBLIC
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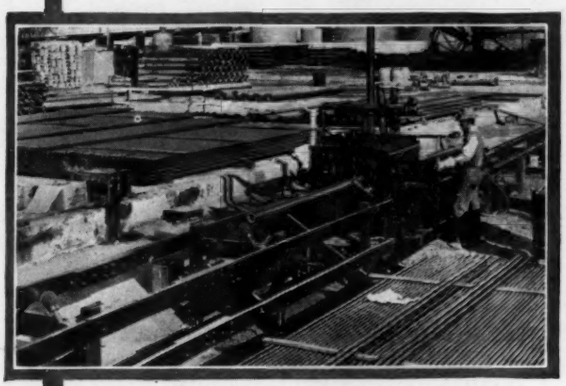
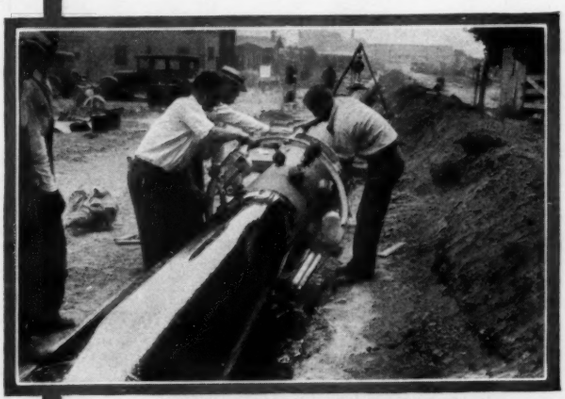
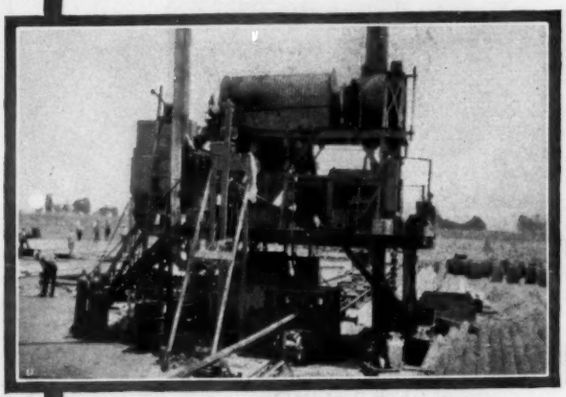
McEVERLAST
Booklet Describes Advantages of
Mechanical Wrapping for Your Job



Yard wrapping machines reduce labor costs and assure uniformity of application.



Hand wrapping machine, used in the field to apply Osnaburg wrap or asbestos pipe line felt.



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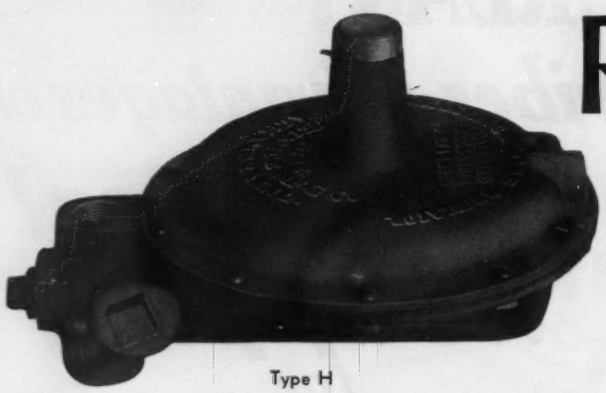
(Western Gas, November, 1930)



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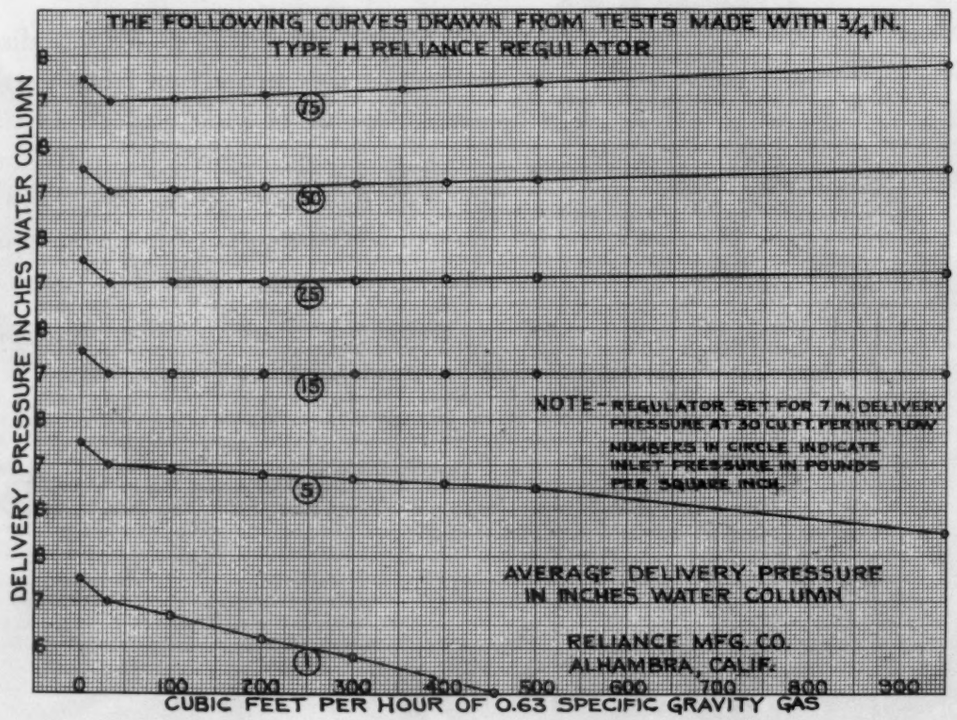
THE FOLLOWING CURVES DRAWN FROM TESTS MADE WITH 3/4 IN. TYPE H RELIANCE REGULATOR
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50
25
15
5
1
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Contents for November, 1930

Factors Effecting a Minimum Cost in Gas Pipe Lines	*By* W. R. KEPLER	23
Enriching Oil Gas with Butane at Tucson	*By* C. H. WEBBER	28
Visual Operating Data: An Aid to Effective Company Management	*By* G. B. SHEPPARD	29
Compensate Your Salesmen for Business Development	*By* ROY G. MUNROE	31
The Right and Wrong of Right of Way Procedure	*By* C. H. PROUTY	33
An Inducement Rate Schedule in Seattle	*By* JAMES F. POLLARD	34
Change-Over to Gas Spells Economies for This Gray Iron Foundary	*By* WALTER E. LIND	36
The Women's Committee as a Morale Builder	*By* ADDISON B. DAY	38
One Company's Experience with Gas Appliance Servicing	*By* C. E. SHERBURNE	39
Pacific Coast Gas Association		40
A. G. A. Convention Hits New High	*By* CRAIG ESPY	44
With the Metermen		46
Correcting for Temperature in Large Volume Positive Displacement Measurement	*By* H. M. CRAWFORD	
Gas Flow Temperature Through Orifice Meters	*By* MARIS LEVERING	

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and cut down maintenance

LET old Bird Creek overflow whenever it will! Its raging torrents can never harm the two pipe lines on this 340-foot span, four feet above high water mark. Two well designed 12-inch bends on the right bank convey natural gas from the underground lines to the suspension bridge level. These bends also serve as expansion units.

Cities Service Gas Company took this unusual means to insure uninterrupted service and freedom from high maintenance costs at their Tallant, Oklahoma crossing. While they were anxious to obtain a neat appearing job on account of the nearby highway, their first concern was a successful engineering venture.

For this reason they chose pipe with a high rating for strength, ductility, uniformity and particular fitness for constructions as unusual as this. They said, NATIONAL—

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SAN FRANCISCO **LOS ANGELES** **DALLAS**

Factors Effecting *a* Minimum Cost *in* Gas Pipe Lines

By W. R. KEPLER

A. O. Smith Corporation, Milwaukee, Wisconsin

THIS study of the cost of pipe line installations was made primarily to anticipate what diameters and wall thicknesses might possibly be demanded by the gas industry in economically designing large capacity long distance transmission lines.

Although the various factors considered here in studying the cost of gas pipe lines are, no doubt, generally known, the combination of the factors as used and the information and curves prepared may be of some interest to the gas industry.

A rough calculation made during the beginning of this study showed that 150 million cubic feet of gas per day could be transmitted over a 100-mile section of line through a 20-inch diameter pipe with 775 pounds per square inch inlet pressure, requiring 260 tons of steel per mile; through a 24-inch pipe, using 233 tons; through a 30-inch pipe, using 186 tons; or if a 60-inch diameter line could be used only 73 tons of steel per mile would be required at about 21.5 pounds pressure, the 20-inch pipe requiring 3½ times as much steel as the 60-inch pipe.

It was also brought out that, to transmit say 100 million cubic feet over a distance of 100 miles, having a rock pressure at the inlet of 600 pounds per square inch and a discharge at the outlet of 100 pounds per square inch, less steel per mile would be used if the inlet pressure were deliberately reduced to 200 pounds per square inch. The line using 600 pounds pressure would require a pipe 17.7-inch outside diameter with 174 tons per mile; the 200 pound pressure line would require a pipe of about 27-inch theoretical outside diameter with only 136 tons per mile.

These examples indicate that the use of larger diameter pipe at lower operating pressures resulted in less steel per mile than if smaller diameters of pipe at higher operating pressures were used. Further studies, covering a large range of capacities and diameters of pipe indicated the same results. When considering the cost of laying the line, cost of compressor stations, the operating and fixed yearly cost along with the cost of the steel, the use of large diameter pipe at low operating pressure resulted in the most economical design of the line.

These investigations were carried on by a group of engineers who made a mathematical analysis of the formulae for flow of gas, stress in pipe and weight of steel. Information was obtained from outside engineers familiar with pipe line practice and operating knowledge, from companies making large gas compressor units, from data contained in reliable technical articles, and from actual costs of lines laid by several gas companies.

AMONG the many features on the American Gas Association convention program which were of importance to those concerned with gas transmission, the paper by W. R. Kepler, given before the Technical Section, was outstanding. It reflects a thorough study into all factors affecting the total cost of gas pipe lines, and points unmistakably toward use of thin wall large diameter pipe for maximum economies. Safety factors of three or even less are advocated.

Because of the length of the paper, it is presented in two installments, the second to follow in the December issue.—*Editor.*

Method Used in Study of Pipe Lines

These studies to obtain the minimum cost of the line begin with that stage in the development of the line where the pipe line company has assured itself that there is sufficient gas at the source of supply, that a market exists and that sufficient study has been made to fix the probable maximum quantity to be transmitted. The problem is to determine the minimum cost of a line to transmit that amount of gas.

The Weymouth formula has been used in these calculations. Upon this formula, which gives the relation of diameter, length, pressure and pressure ratios, all calculations and curves have been based.

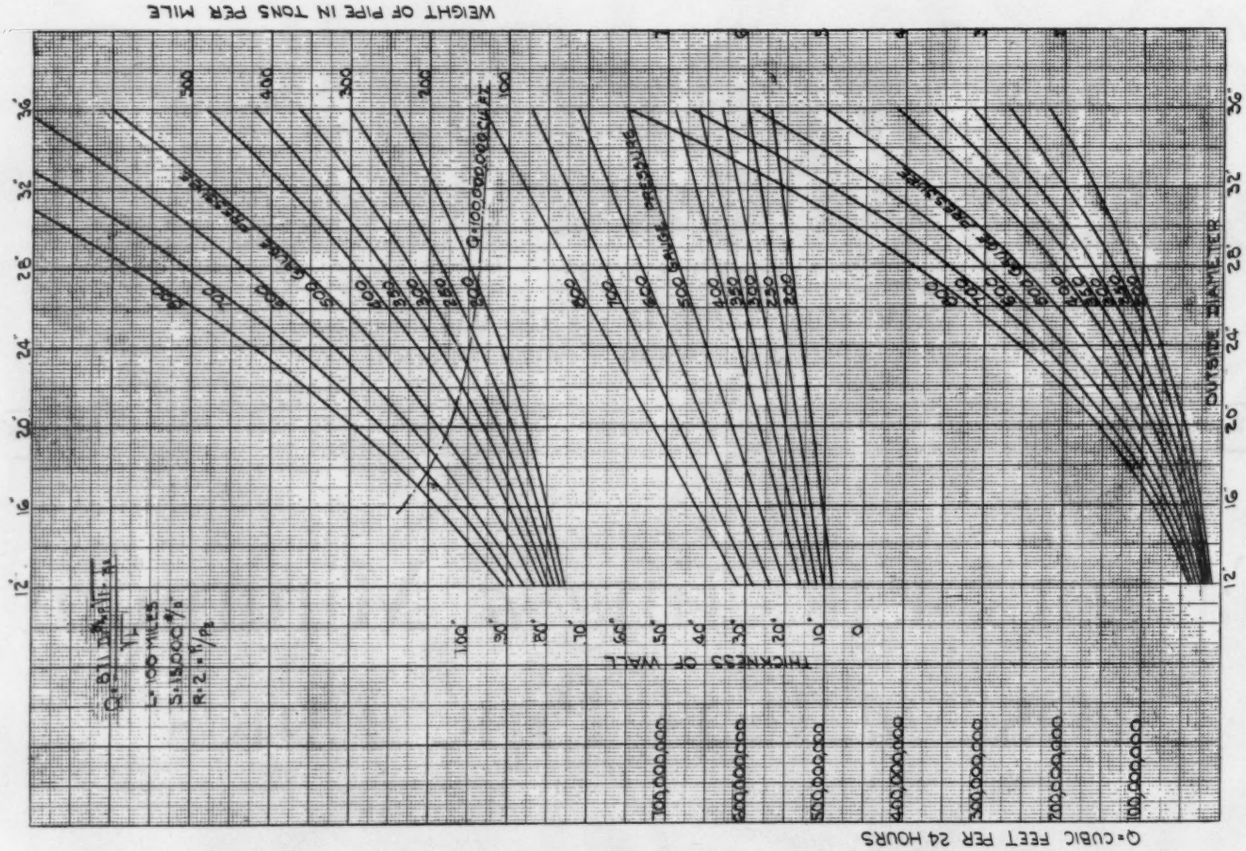


FIG. II - WEIGHT AND CARRYING CAPACITY OF PIPE FOR NATURAL GAS FOR VARIOUS DIAMETERS AND PRESSURES.

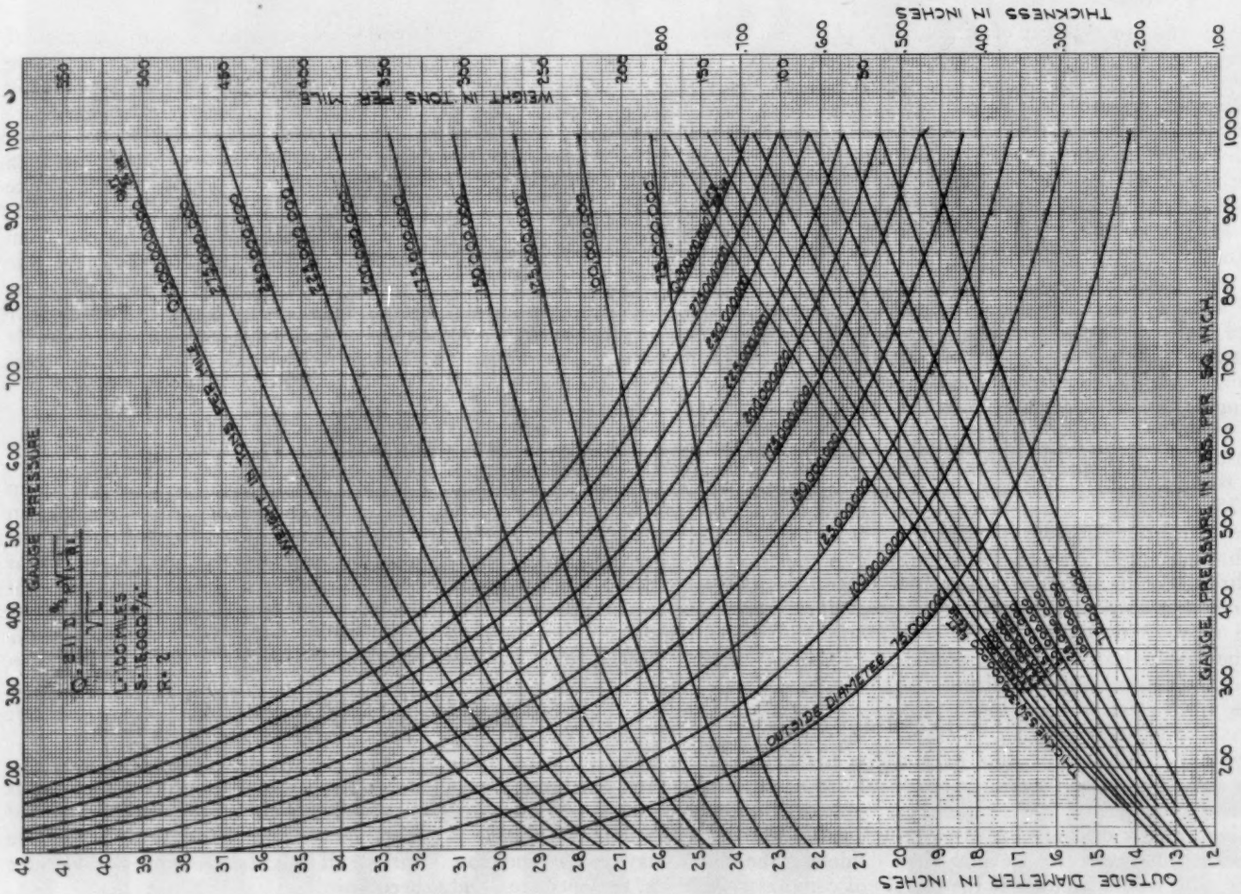


FIG. I - DIAMETER AND WEIGHT OF PIPE TO CARRY A GIVEN QUANTITY OF NATURAL GAS AT VARIOUS PRESSURES.

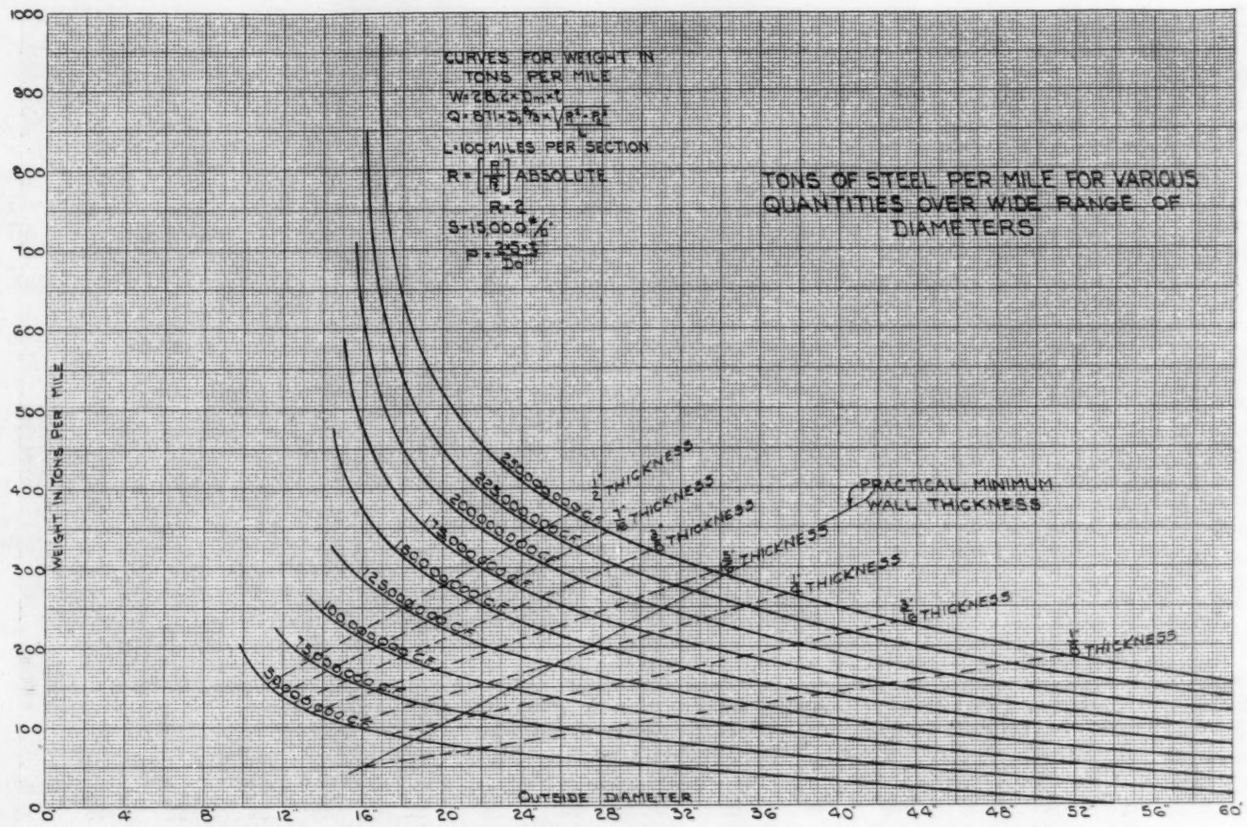


FIG. III - TONS OF STEEL PER MILE AND CARRYING CAPACITY OF PIPE FOR NATURAL GAS FOR A WIDE RANGE OF DIAMETERS.

The following formulae have been used for flow, stress in pipe and weight:

Weymouth's formula for the capacity of the line:

$$Q = 871\ D_1^{8/3} \sqrt{P_1^2 - P_2^2} \times \frac{1}{\sqrt{L}} \qquad (1)$$

$$Q = 871\ D_1^{8/3}\ P_1 \sqrt{1 - \frac{1}{R_2}} \times \frac{1}{\sqrt{L}} \qquad (1-a)$$

Barlow's formula for obtaining the stress:

$$S = \frac{P\ D_o}{2\ t} \qquad (2)$$

$$t = \frac{P\ D_o}{2\ S} \qquad (2-a)$$

Weight formula:

$W = 28.2\ (D_o - t)\ t$ for tons per mile (3)

$w = 10.68\ (D_o - t)\ t$ for pounds per ft. (3-a)

The symbols used in the above three formulae are as follows:

Q—Cu. ft. per day at 14.6 lb. per sq. in. absolute pressure for gas with a specific gravity of .60 at 60° Fahr.

D_1—Inside diameter of pipe in inches.

D_o—Outside diameter of pipe in inches.

P_1—Absolute pressure in pounds per sq. in. at inlet into line or section of line between compressor stations.

P_2—Absolute pressure in pounds per sq. in. at discharge end of line or section of line between compressor stations.

P—Gauge pressure in pounds per sq. in.

L—Length in miles of sections between compressor stations.

t—Thickness of wall of pipe in inches.

S—Permissible fiber stress in pounds per sq. in. in pipe walls. (hoop stress)

W—Tons of pipe per mile.

w—Weight of pipe per foot in length.

To find the effect of various pressures and diameters upon the carrying capacity of the line and the weight of steel in the pipe, curves were prepared covering a large range of diameters and pressures, etc., which give a complete picture of the inter-relation of the variables in the formulae.

Fig. I shows curves that give the pipe diameter, wall thickness and weight for gauge pressures ranging from 100 to 1000 pounds per square inch for various quantities Q.

The curves were plotted from calculations using formula

$$D_1^{8/3} = \frac{Q\sqrt{L}}{871\ P_1 \sqrt{1 - \frac{1}{R^2}}} \qquad (1-b)$$

to obtain the diameter of a pipe to carry a given Q at pressures ranging from 100 to 1000 pounds per square inch.

The thickness t is obtained from formula (2-a)

Fig. II shows curves that give the quantity Q, wall thickness t and weight for diameters from 12 inches to 36 inches for various pressures.

The curves were plotted from calculations using formulae (2-a) (1-a) and (3) to obtain the wall thickness, carrying capacity and pipe weights for various pressures.

Fig. III shows curves that give the weight in tons per mile for various quantities Q for a large number of diameters.

The points on the curve for a given quantity Q may be obtained by the use of formulae (1-b) and

$$P = \frac{2\ S\ t}{D_o}$$

by the cut and try method for each diameter; however, these curves were made by the use of a mathematical formula.

All of the curves have been made using a hoop stress in the wall of the pipe of 15,000 pounds per square inch, R = 2 for the absolute pressure ratio and L = 100 miles. The length L = 100 miles is used for convenience in calculating the capacity and diameter for lengths other than 100 miles.

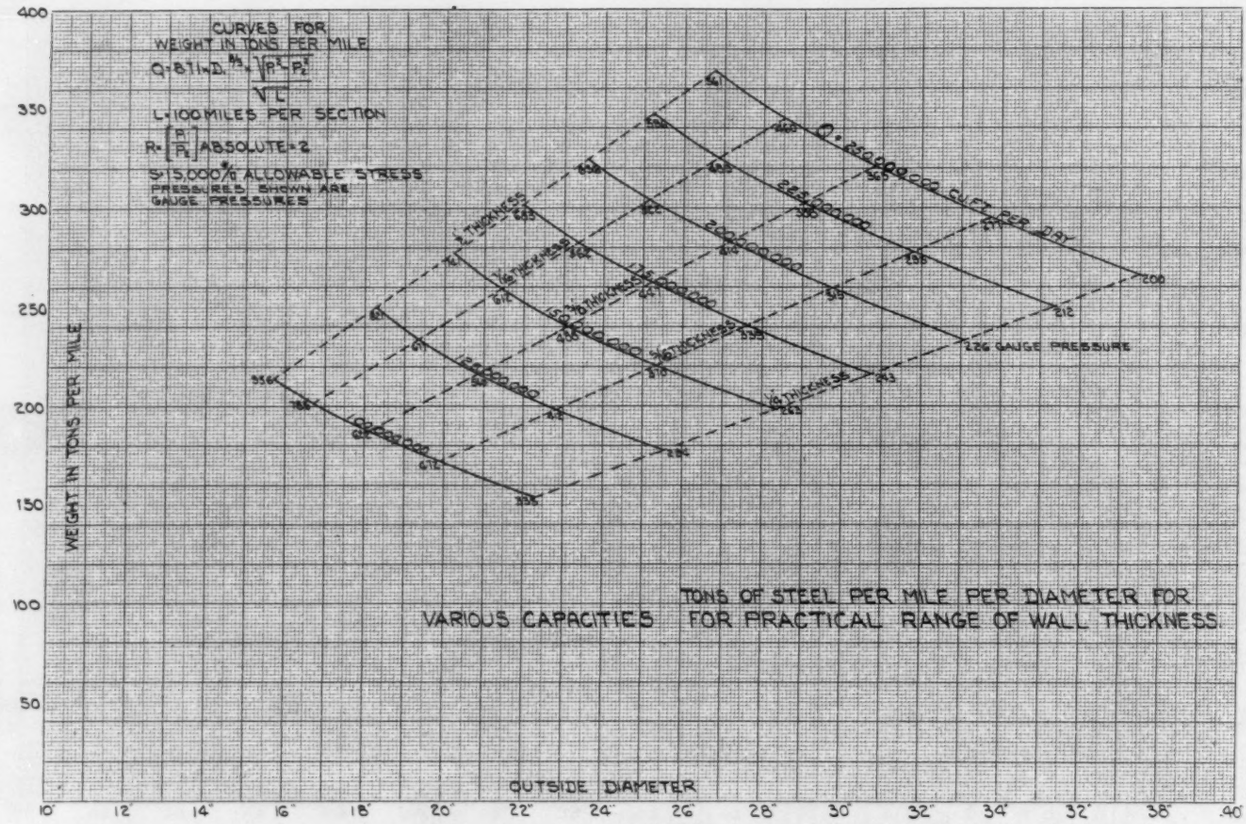


FIG. IV - TONS OF STEEL PER MILE AND CARRYING CAPACITY OF PIPE FOR NATURAL GAS FOR PRACTICAL RANGE OF WALL THICKNESS.

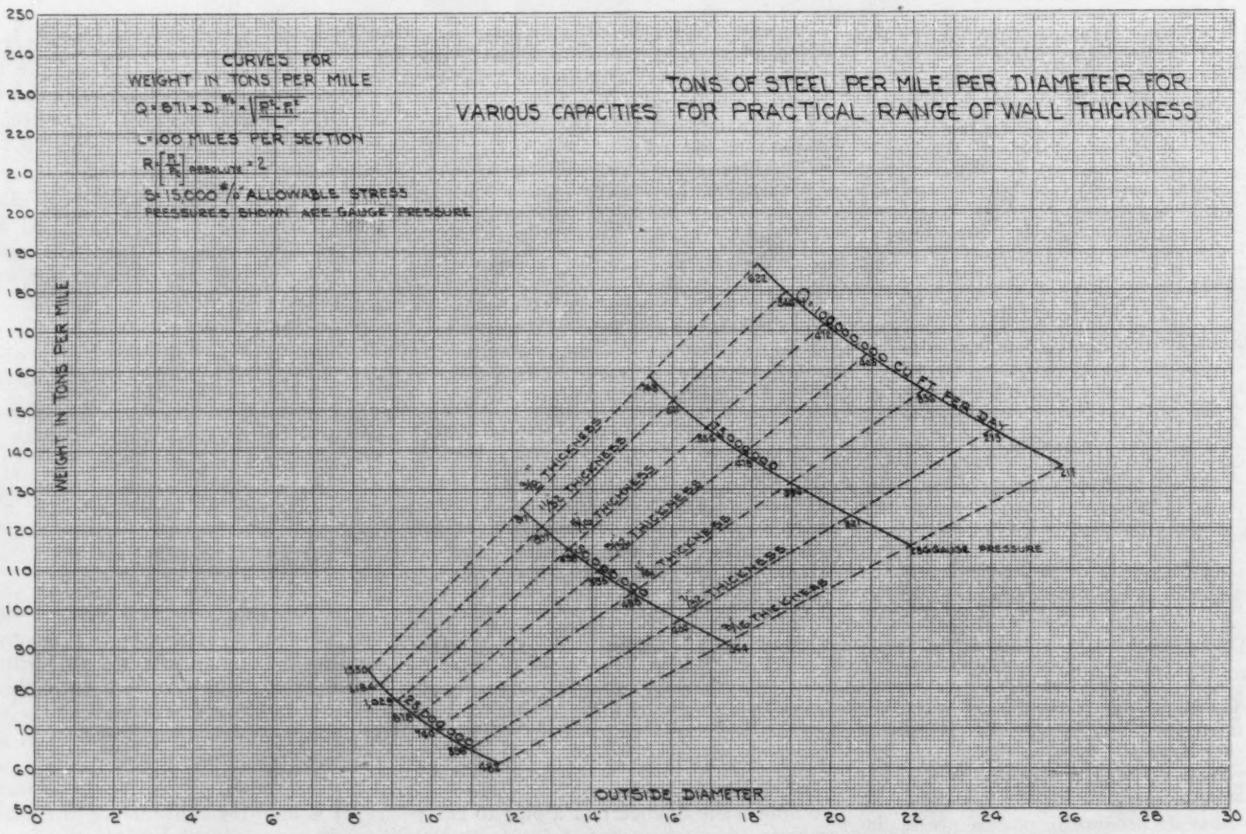

CURVES FOR
WEIGHT IN TONS PER MILE
L=100 MILES PER SECTION
R=[P1/P2] ABSOLUTE=2
S=15,000#/□" ALLOWABLE STRESS
PRESSURES SHOWN ARE GAUGE PRESSURE
TONS OF STEEL PER MILE PER DIAMETER FOR
VARIOUS CAPACITIES FOR PRACTICAL RANGE OF WALL THICKNESS
WEIGHT IN TONS PER MILE
OUTSIDE DIAMETER

FIG. V - TONS OF STEEL PER MILE AND CARRYING CAPACITY OF PIPE FOR NATURAL GAS FOR PRACTICAL RANGE OF WALL THICKNESS.

From formulae

$$Q\sqrt{L}=871\ D_1^{8/3}\ P_1\ \sqrt{1-\frac{1}{R^2}} \qquad (1-c)$$

the product of $Q \times \sqrt{L}$ is shown to be constant for a line having the same diameter, pressure and ratio R.

The curves may be used as follows:

To find the quantity Q for a line with length L multiply the quantity Q_{100} as taken from the curves for L = 100 miles by $\frac{10}{\sqrt{L}}$ or

$$Q=\frac{Q_{100}\sqrt{100}}{\sqrt{L}}$$

To find the diameter D_o for a given quantity Q and length L calculate the quantity Q_{100} that the same line would carry at 100 miles by multiplying the given Q by $\frac{\sqrt{L}}{10}$ or

$$Q_{100}=\frac{Q\sqrt{L}}{\sqrt{100}}$$

With this Q_{100} the diameter, pressure, etc., may be read directly from the curves.

Conditions Resulting in the Least Amount of Steel

From Fig. I it may be observed how the diameter of a pipe necessary to carry any given quantity of gas decreases as the pressure is increased and also how the weight of steel in tons per mile increases with the pressure. For example, 150 million cubic feet may be carried with an inlet pressure of 775 pounds in a 20-inch pipe requiring 260 tons of steel per mile or the same quantity may be carried with 275 pounds inlet pressure in a 28-inch pipe requiring only 200 tons of steel per mile.

For a given quantity of gas, curves in Fig. II show how the pressure and weight of steel per mile decrease with an increase of the diameter. For example, 100 million cubic feet may be carried in an 18-inch line at 650 pounds inlet pressure requiring 195 tons of steel per mile or in a 24-inch pipe at about 275 pounds inlet pressure, requiring 150 tons of steel per mile.

The curves on Fig. III give a very clear and complete illustration of the advantage of using large diameter thin wall pipes to obtain a minimum amount of steel. They show the tons of steel per mile in the pipe for diameters as small as could be used to carry a given quantity even at extremely high pressures up to diameters of 60 inches and low pressures. One hundred and fifty million cubic feet could be carried in a 16-inch pipe requiring 375 tons of steel per mile or in a 60-inch pipe requiring only 75 tons per mile. For any thickness much above ½-inch the tons of steel per mile increase very rapidly for a small decrease in diameter. Although the weight is materially less for large diameters, say 60 inches, the wall thickness would be such that the pipe would be difficult to handle. Such an extremely large diameter would necessitate a very large ditch and the cost of laying would more than offset the advantage gained in the saving of steel.

It is evident that considering the minimum amount of steel only in the cost of a line, a pipe should be chosen with the largest possible diameter necessary to carry the given quantity and limit it only by a practical wall thickness. The matter of judgment or opinion enters here for the first time in the study as to what this practical wall thickness should be, but for the larger sizes, say a 36-inch diameter pipe, 5/16-inch might be considered a minimum, while for a 16-inch diameter, ⅛-inch could be taken as a minimum. Some

(*Continued on Page 60*)

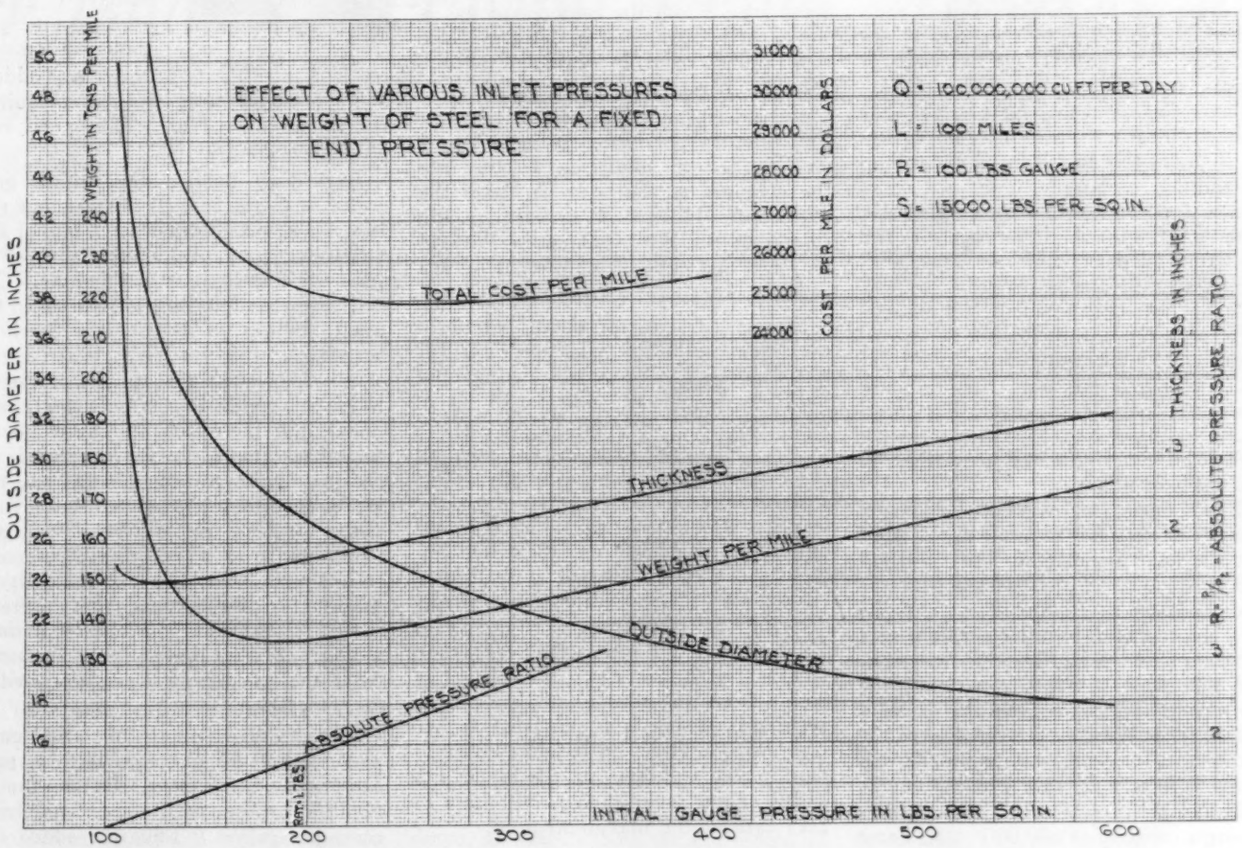
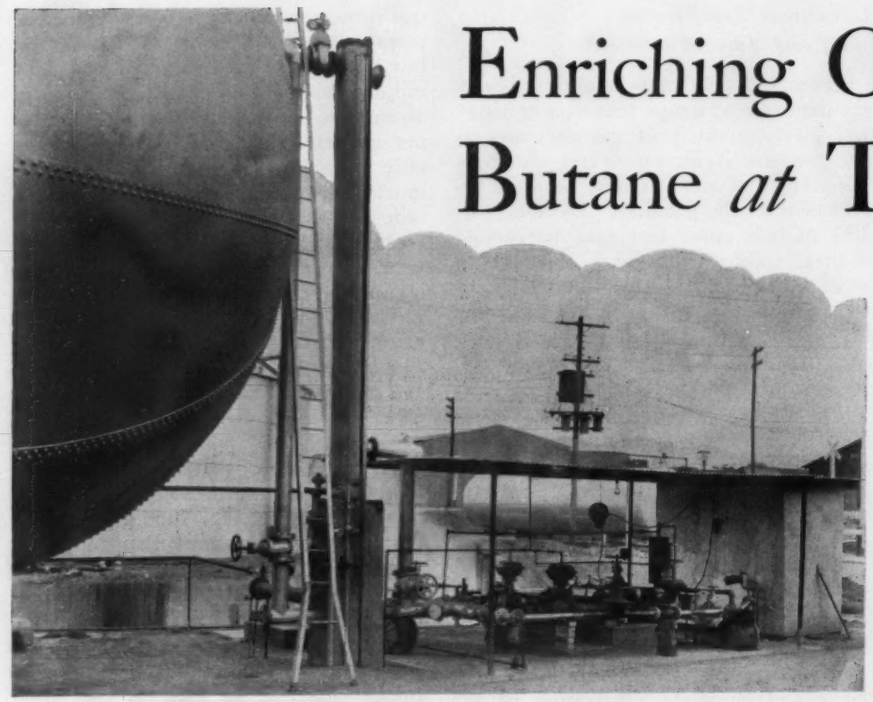

EFFECT OF VARIOUS INLET PRESSURES ON WEIGHT OF STEEL FOR A FIXED END PRESSURE
Q = 100,000,000 CU.FT. PER DAY
L = 100 MILES
P2 = 100 LBS. GAUGE
S = 15000 LBS. PER SQ. IN.
TOTAL COST PER MILE
THICKNESS
WEIGHT PER MILE
OUTSIDE DIAMETER
ABSOLUTE PRESSURE RATIO
OUTSIDE DIAMETER IN INCHES
WEIGHT IN TONS PER MILE
COST PER MILE IN DOLLARS
THICKNESS IN INCHES
R = P1/P2 = ABSOLUTE PRESSURE RATIO
INITIAL GAUGE PRESSURE IN LBS. PER SQ. IN.
100
200
300
400
500
600

FIG. VI - EFFECT OF REDUCING HIGH ROCK PRESSURE ON WEIGHT OF STEEL FOR A FIXED OUTLET PRESSURE.

Enriching Oil Gas *with* Butane *at* Tucson

By C. H. WEBBER

Superintendent Gas Department, Tucson Gas, Electric Light & Power Company, Tucson, Arizona



Left to right: High pressure storage at Tucson, Ariz.; 16-inch vertical secondary condenser used for partial vaporization of liquid butane; regulators and calorimeter house; 17,500-gallon butane storage tank (100-pound working pressure) seen in background.

FACING the problem several months ago of adding more generating capacity, which at that time seemed illogical due to the fact of the possibility of natural gas service in Tucson, it was decided to carry on certain experiments in making a lean oil gas of about 400 B.t.u's. per cu.ft. and bringing it up to the 500 B.t.u. standard by the addition of butane.

It was estimated that an expenditure of about $50,000 would be necessary for additional oil gas generating capacity as against an estimated expenditure of $3,000 for butane equipment. Theoretically, a set-up using butane as an enricher would increase present plant capacity some 23 per cent, due to more favorable operation in generating a lean gas.

A brief description of conditions in Tucson is as follows:

The company serves 5,000 consumers. Due to extreme hot weather in the summer the daily sendout amounts to 450,000 cu.ft., while in the winter time the load increases to 1,000,000 cu.ft. daily. Gas is generated in three straight-shot generators, two being 6 ft. 6-in. machines and the third a 9-foot generator; the capacity of the 9-foot generator is 500,000 cu.ft. daily while the capacity of the two 6-ft. 6-in. generators is 300,000 cu. ft. each, or a total of 1,100,000 cu. ft. daily. Gas is stored in two holders having a capacity of 600,000 cu.ft. From the holders, gas is compressed for dehydration purposes so that the finished gas reaching the mains will show a sufficiently low dew point to eliminate condensation. From the compressor, gas is stored in a 50,000 cu.ft. high pressure tank and from there regulated to distribution pressure.

In considering the proposed lay-out for a butane enriching installation, it was decided to admit the butane into the lean gas at the point it leaves the regulator. Thus at all times there is a storage of 400 B.t.u..gas, or thereabouts, on hand, and none of the present storage capacity is used for storing enriched gas.

Storage capacity for liquid butane to the extent of 17,500 gals. was installed, together with the necessary fittings and piping to the plant. The liquid leaves the tank and is expanded into the secondary heat exchanger used in cooling the gas for dehydration purposes. Thus a decided drop of temperature in the lean gas is accomplished. This is an indirect condenser. From there the butane goes through a small steam heater which further gasifies any vapors brought over, and from there goes to a 1500 cu.ft. high pressure storage tank where it is stored until needed. The piping from this storage tank goes to the regulators where it is admitted to the lean gas. This set-up requires no automatic valve regulaton on the liquid and sufficient gas is on hand at all times to take care of the maximum need.

Results on two weeks' operation are as follows:

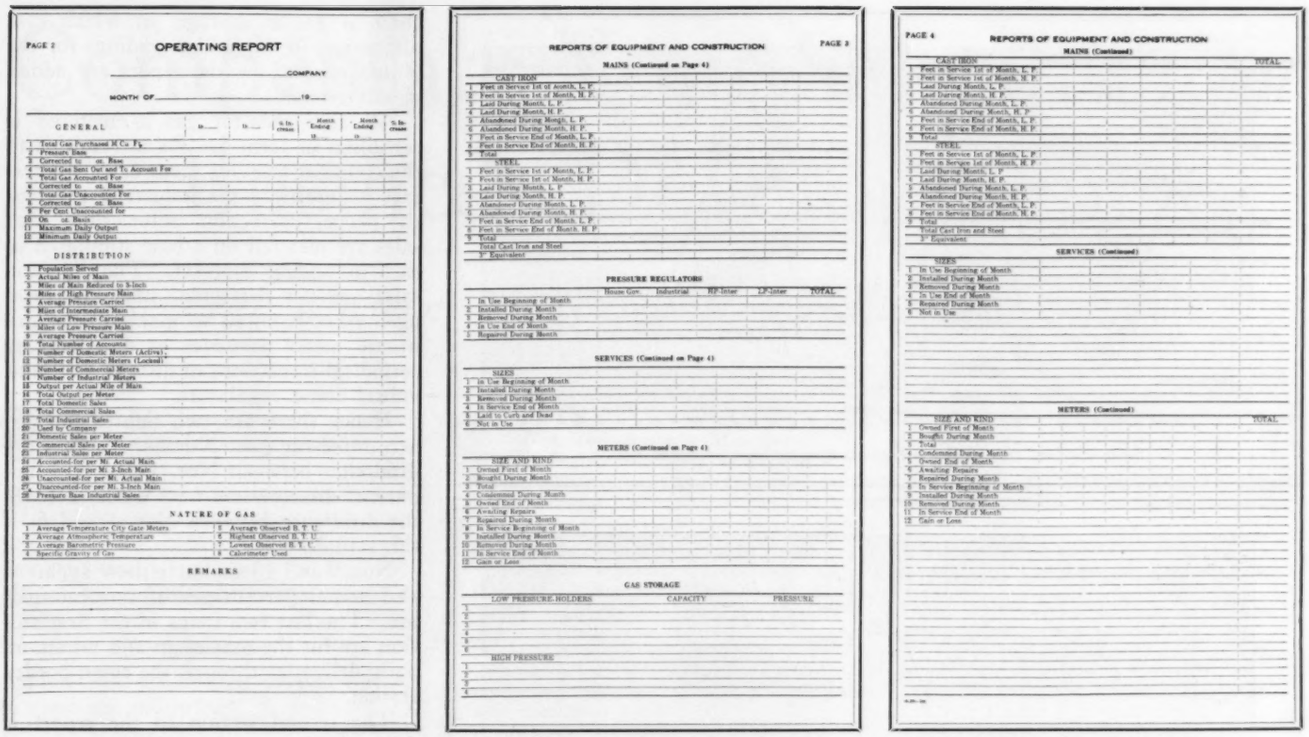
Manufacturing a 500 B.t.u. straight oil gas averaged 7.6 gallons per thousand. Generator operation was on a ratio of 1 gallon heat oil to 10 gallons make. This gas averaged .34 specific gravity. Under the lean gas operation, B.t.u's. per cu.ft. averaged 378 of a specific gravity of .29. The resulting ratio of heat oil to make oil was 1 to 7.1 gallons. Gas was made on 6.1 gallons per thousand or a saving of 1.5 gallons per thousand. Approximately 1 gallon of butane per thousand cu. ft. of gas was added, which brought the gas up to the required B.t.u. content. This resulting gas was of .35 specific gravity.

C. H. Webber

Regarding the operation of the generator, it might be well to state that this experiment was carried on in one of our 6-ft. 6-in. generators which had been in daily use for the past five months. Operation on straight oil gas resulted in the usual amount of by-products, such as lampblack, with possibly a lesser degree of tar than is usual in oil gas operation. With the generating of lean gas it was found that there was absolutely no tar and that lampblack was decreased approximately one-third. During the two weeks operation it was not found necessary to clean the off-take of the generator nor any of the other piping. In other words, other than for the daily inspection of the burners, the generator could be operated indefinitely without a clean-up shut-down. Approximately twice the amount of steam was used in the generation.

The saving in oil per thousand cu.ft. amounted to 1.5 gallons, which at present prices costs 6 cents. Butane for enriching purposes costs approximately 10 cents per gallon. Thus the added cost for manufacturing gas using butane

(*Continued on Page 64*)



PAGE 2

OPERATING REPORT

_____COMPANY

MONTH OF_____19____

GENERAL	In____	In____	% Increase	Month Ending 19	Month Ending 19	% Increase
1 Total Gas Purchased M Cu. Ft.						
2 Pressure Base						
3 Corrected to ____ ot. Base						
4 Total Gas Sent Out and To Account For						
5 Total Gas Accounted For						
6 Corrected to ____ ot. Base						
7 Total Gas Unaccounted For						
8 Corrected to ____ ot. Base						
9 Per Cent Unaccounted for						
10 Ob____ ot. Basis						
11 Maximum Daily Output						
12 Minimum Daily Output						

DISTRIBUTION

1 Population Served	
2 Actual Miles of Main	
3 Miles of Main Reduced to 3-Inch	
4 Miles of High Pressure Main	
5 Average Pressure Carried	
6 Miles of Intermediate Main	
7 Average Pressure Carried	
8 Miles of Low Pressure Main	
9 Average Pressure Carried	
10 Total Number of Accounts	
11 Number of Domestic Meters (Active)	
12 Number of Domestic Meters (Locked)	
13 Number of Commercial Meters	
14 Number of Industrial Meters	
15 Output per Actual Mile of Main	
16 Total Output per Meter	
17 Total Domestic Sales	
18 Total Commercial Sales	
19 Total Industrial Sales	
20 Used by Company	
21 Domestic Sales per Meter	
22 Commercial Sales per Meter	
23 Industrial Sales per Meter	
24 Accounted-for per Mi. Actual Main	
25 Accounted-for per Mi. 3-Inch Main	
26 Unaccounted-for per Mi. Actual Main	
27 Unaccounted-for per Mi. 3-Inch Main	
28 Pressure Base Industrial Sales	

NATURE OF GAS

1 Average Temperature City Gate Meters	5 Average Observed B. T. U.
2 Average Atmospheric Temperature	6 Highest Observed B. T. U.
3 Average Barometric Pressure	7 Lowest Observed B. T. U.
4 Specific Gravity of Gas	8 Calorimeter Used

REMARKS

REPORTS OF EQUIPMENT AND CONSTRUCTION PAGE 3

MAINS (Continued on Page 4)

CAST IRON	
1 Feet in Service 1st of Month, L. P.	
2 Feet in Service 1st of Month, H. P.	
3 Laid During Month, L. P.	
4 Laid During Month, H. P.	
5 Abandoned During Month, L. P.	
6 Abandoned During Month, H. P.	
7 Feet in Service End of Month, L. P.	
8 Feet in Service End of Month, H. P.	
9 Total	
STEEL	
1 Feet in Service 1st of Month, L. P.	
2 Feet in Service 1st of Month, H. P.	
3 Laid During Month, L. P.	
4 Laid During Month, H. P.	
5 Abandoned During Month, L. P.	
6 Abandoned During Month, H. P.	
7 Feet in Service End of Month, L. P.	
8 Feet in Service End of Month, H. P.	
9 Total	
Total Cast Iron and Steel	
10 Equivalent	

PRESSURE REGULATORS

	House Gov.	Industrial	HP-Inter	LP-Inter	TOTAL
1 In Use Beginning of Month					
2 Installed During Month					
3 Removed During Month					
4 In Use End of Month					
5 Repaired During Month					

SERVICES (Continued on Page 4)

SIZES	
1 In Use Beginning of Month	
2 Installed During Month	
3 Removed During Month	
4 In Service End of Month	
5 Laid to Curb and Dead	
6 Not in Use	

METERS (Continued on Page 4)

SIZE AND KIND	
1 Owned First of Month	
2 Bought During Month	
3 Total	
4 Condemned During Month	
5 Owned End of Month	
6 Awaiting Repairs	
7 Repaired During Month	
8 In Service Beginning of Month	
9 Installed During Month	
10 Removed During Month	
11 In Service End of Month	
12 Gain or Loss	

GAS STORAGE

LOW PRESSURE-HOLDERS	CAPACITY	PRESSURE
1		
2		
3		
4		
5		
6		
HIGH PRESSURE		
1		
2		
3		
4		

PAGE 4

REPORTS OF EQUIPMENT AND CONSTRUCTION

MAINS (Continued)

CAST IRON	TOTAL
1 Feet in Service 1st of Month, L. P.	
2 Feet in Service 1st of Month, H. P.	
3 Laid During Month, L. P.	
4 Laid During Month, H. P.	
5 Abandoned During Month, L. P.	
6 Abandoned During Month, H. P.	
7 Feet in Service End of Month, L. P.	
8 Feet in Service End of Month, H. P.	
9 Total	
STEEL	
1 Feet in Service 1st of Month, L. P.	
2 Feet in Service 1st of Month, H. P.	
3 Laid During Month, L. P.	
4 Laid During Month, H. P.	
5 Abandoned During Month, L. P.	
6 Abandoned During Month, H. P.	
7 Feet in Service End of Month, L. P.	
8 Feet in Service End of Month, H. P.	
9 Total	
Total Cast Iron and Steel	
10 Equivalent	

SERVICES (Continued)

SIZES	
1 In Use Beginning of Month	
2 Installed During Month	
3 Removed During Month	
4 In Use End of Month	
5 Repaired During Month	
6 Not in Use	

METERS (Continued)

SIZE AND KIND	TOTAL
1 Owned First of Month	
2 Bought During Month	
3 Total	
4 Condemned During Month	
5 Owned End of Month	
6 Awaiting Repairs	
7 Repaired During Month	
8 In Service Beginning of Month	
9 Installed During Month	
10 Removed During Month	
11 In Service End of Month	
12 Gain or Loss	

Monthly operating report form used by United Gas Corporation agents and managers. Individual reports are consolidated at company headquarters.

Visual Operating Data: *An* Aid *to* Effective Company Management

By G. B. SHEPPARD
United Gas Engineering Corporation
Houston, Texas

A SERIES of graphs showing vital operating information is as essential to the manager of a gas company as is a hard surfaced road to a bus driver on an interurban schedule. No man could operate a company without reports and the general office is the headquarters for reports of all kinds—daily, weekly, monthly, yearly reports; operating statistics, financial figures, special investigations; all of them important, but many of them in such shape that the manager has no time to study them. It is the function of graphs to present these reports in such a way that the manager can read them at a glance. Drawing curves for a manager is like shelling peanuts for a hungry man or melting ice for a thirsty polar explorer.

The United Gas Corporation transports gas to and distributes it in a multitude of towns and cities in Texas. The communities are of all sizes, the number of meters in the smallest being three, and in the largest 50,000. A form of monthly operating report was devised under the direction of A. C. Howard, consulting engineer. The agent or manager in charge of each town or group of towns forwards each month to the central office a separate report for each town under his jurisdiction, using the standard form. This report goes into considerable detail and lists all the important operating data not only for the current month, but also for the corresponding month of the preceding year. Cumulative figures for the year to date are set down, as well as those for the preceding year to date. The report is divided into several sections, which will be described.

G. B. Sheppard

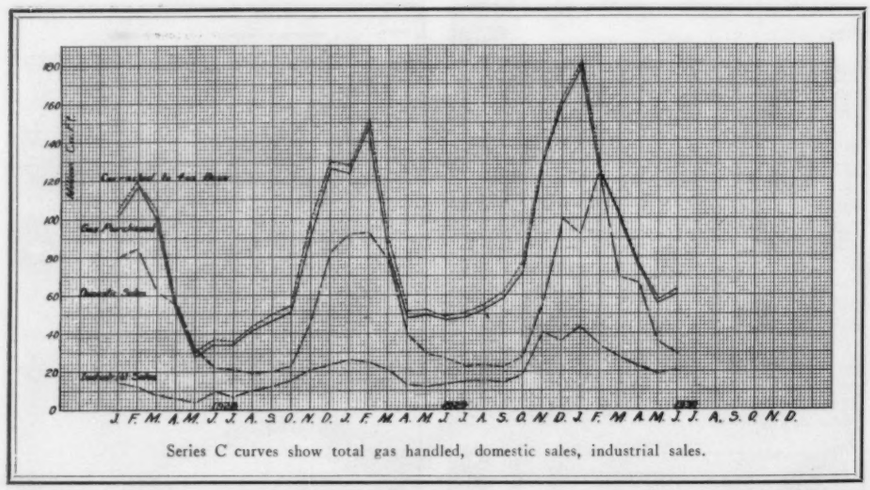
In order to simplify matters in consolidating the operating reports into one in the main office, provisions are made in the first section to reduce all gas metered to a common base. This has made necessary a definition of a cubic foot of gas, which for our purposes has been made the amount of gas which will occupy a cubic foot under an absolute pressure of 14.95 pounds, assuming a temperature of 60° Fahrenheit. This standard was adopted because the largest percentage of gas sold is metered at 4 ounces gage pressure above an atmospheric pressure that averages 14.7 pounds. The base pressures of the gas delivered at the town border stations vary from 14.65 pounds absolute to 16.4 pounds.

The cubic feet of gas delivered to the town reporting is set down in Item 1 of the report.

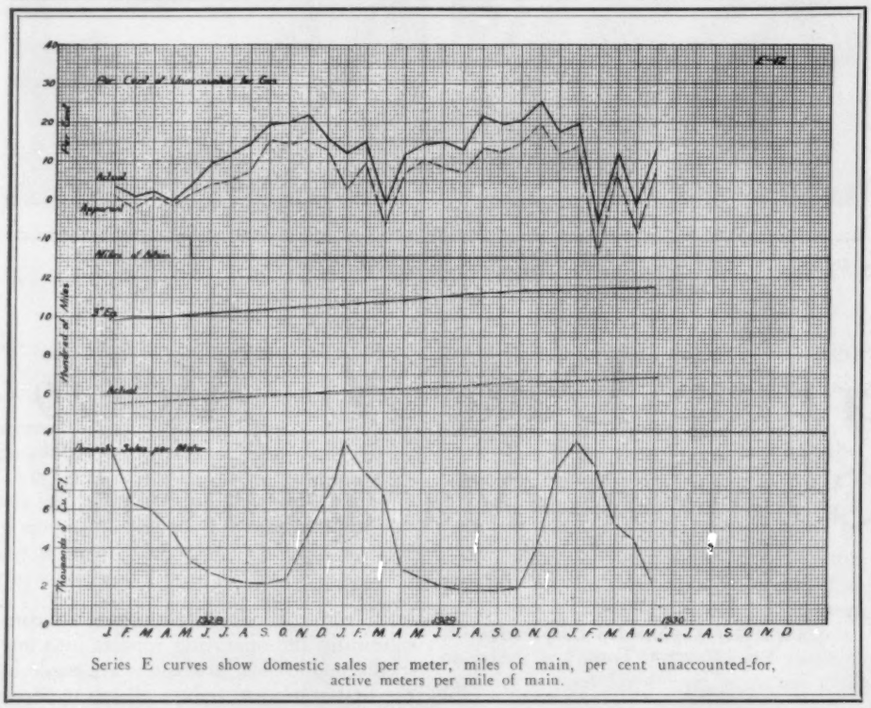
The pressure base is noted in Item 2.

The figure for Item 3 is obtained from Item 1 by multiplying by the proper correction factor.

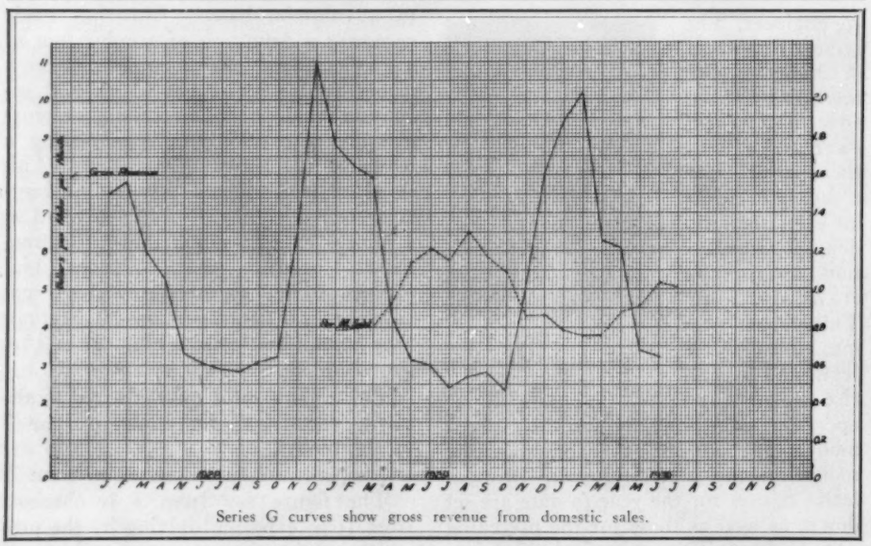
Item 4 is the same as Item 3, unless



Series C curves show total gas handled, domestic sales, industrial sales.



Series E curves show domestic sales per meter, miles of main, per cent unaccounted-for, active meters per mile of main.



Series G curves show gross revenue from domestic sales.

The three graphs above are typical of many others which present details of operating reports to the United Gas Corporation management.

there is gas in storage, in which case differences in the holder readings for the period covered by the report are added or subtracted.

All accounted-for gas as metered is set down in Item 5. To correct this to the common base for Item 6, it is necessary to multiply the industrial sales by the proper correction factor, since such sales are metered on a base stipulated in each individual contract. The domestic sales are not corrected, since the local agents are required to maintain the domestic meter pressures at 4 ounces by periodical inspections of district and individual house regulators.

Hence there are two figures for unaccounted-for gas. Number 7, being the difference between Nos. 1 and 5, is apparent unaccounted-for, while No. 8, the difference between Nos. 4 and 6, is the actual.

Nos. 9 and 10 similarly show apparent and actual percentages of unaccounted-for. The last two items in the first section are for the maximum and minimum daily deliveries through the town border station.

The second section of the report is devoted to operating information and data. The first nine items are for population served, miles of main in service, miles of main reduced to 3-inch equivalent, miles of high pressure main, miles of intermediate pressure main, miles of low pressure main and the average pressures carried on each of these three kinds of main.

Item 10 is for the total number of accounts; i. e., the number of bills sent out.

Nos. 11, 13 and 14 show the numbers of active domestic, commercial and industrial meters, respectively, in service on the last day of the month.

No. 12 shows the number of domestic meters locked off.

Item 15 is for the result obtained by dividing Item 4 in the first section by Item 2 in the second.

No. 16 is obtained by dividing that same Item 4 by the total number of active meters.

Nos. 17, 18, 19 and 20 are for thousands of cubic feet of gas billed domestic, commercial and industrial customers and used by the company, respectively, uncorrected; i. e., not reduced to the common base.

Nos. 21, 22, and 23 are obtained by dividing 17, 18, 19 by 11, 13, and 14, respectively.

Item 24 is the result of dividing Item 6 in the first section by Item 2 in the second, while Item 25 is the result of dividing that same Item 6 by Item 3 of the second section.

Item 8 of the first section is then divided by Item 2 of the second to obtain Item 26 and by Item 3 for Item 27.

(*Continued on Page 54*)

Compensate Your Salesmen *for* Business Development

Several Modern Plans for Rewarding Sales Effort

By ROY G. MUNROE

Gas New Business Manager
Public Service Company of Colorado

IN submitting the 1930 report on Salesmen's Compensation, the A.G.A. Committee headed by Roy G. Munroe of Denver, Colo., points again to basic elements of this problem which the gas industry in too many individual company instances is ignoring. Too many compensation schedules provide no incentive for load-building. While no one schedule of payment for sales effort can serve in all sections, the general principle does apply that such effort should be directed at revenue-building business. And gas sales accomplishments should command rewards comparable to pay schedules in other industries.

Roy G. Munroe

Extracts from Mr. Munroe's committee report, delivered at the October convention, appear in these pages. —*Editor.*

EXAMPLES of member companies compensation schedules for territory sales representatives which recognize the three factors of salary (or guaranteed minimum), commissions (on both load-building and merchandising), and bonuses (or penalties) for unusual performance are as follows:

PLAN NO. 1

Plan No. 1 has been devised having in mind the following:

a. Living wage
b. Sales incentive
c. Ratio of total compensation to volume of business in any one division
d. Simplicity—having in mind work imposed on accounting division by complicated compensation plans.

District Sales Force

1. Drawing account of $27 per week.
2. Load-building bonus (called service credit) $2 per day or $12 per week.
3. *Merchandise Commissions.*

15% on the "delivered only" cash selling price on cash sales.

10% on "delivered only" cash selling price on installment sales.

Retail Water Heating Salesmen

1. Drawing account of $35 per week.
2. Load-building bonus as follows:

First 40 water heaters @ $5
Next 40 water heaters @ $6
Next 40 water heaters @ $7
Next 40 water heaters @ $8
Next 40 water heaters @ $9
All over 200 water heaters @ $10

3. *Merchandise Commissions.* 9% of the monthly sales based on the "delivered only" price.

Commercial Water Heating Salesmen

1. Drawing account of $217.26 per month.
2. Load-building bonus based on the following:

First 25 heaters @ $10
Next 25 heaters @ $11
Next 25 heaters @ $12
Next 25 heaters @ $13
Next 25 heaters @ $14

The load-building bonus for all installations having a gas demand in excess of 750 cu.ft. per hour will be computed from the requirements of each individual case.

3. *Service Credit* of $5 per working day.
4. *Merchandise Commission*

12% on the net cash "delivered only" price of heaters sold direct.

5% on all discounted sales sold through the trade.

Refrigeration Salesmen

1. Drawing account, $35 per week.
2. Load-building bonus as follows:

First 20 refrigerators @ $5
Next 20 refrigerators @ $6
Next 20 refrigerators @ $7
Next 20 refrigerators @ $8
Next 20 refrigerators @ $9
Next 20 refrigerators @ $10
All over 100 refrigerators @ $10

Merchandise Commissions. 8½% on the "delivered only" price.

Note: Where the salesman assists a dealer in closing a sale, the dealer receiving his usual commission, the salesman is allowed his load-building bonus only.

House Heating Salesmen—Retail

1. Salary of $40 per week.
2. Load-building bonus, 3c per sq.ft. of radiation.
3. Merchandise commission of 5% of the "delivered only" price.

Commercial Salesman on unit heaters, garage heaters and radiators.

1. Salary of $40 per week.
2. Load-building bonus, 3c per sq.ft. of radiation.
3. Merchandise Commission of 2% of sales.

Wholesale Salesmen

1. Drawing account of $40 per week.
2. Load-building bonus (called service credit) $3 per day.
3. Merchandise Commission, 3% on discounted sales in quantities of three or more for the use of builders or trade.

PLAN NO. 2

1. Salary of $100 per month.
2. Load-building commission of 20c per M cu.ft. yearly rating; load-building commission on gas appliances sold to employees will be paid only on storage water heaters.

Load-building commissions:

	Load Building Commissions	*A.G.A. Rating M cu. ft. per year*
Tank water heaters	$1.50	7.5
20 gal. auto. storage	4.80	24
30 gal. auto. storage	5.40	27
30/40 gal. auto storage	6.00	30
50/66 gal. auto. storage	7.20	36
Cabinet range	3.60	20
Double oven range	1.80	18
Single oven range		16
Comb. range		14
Incinerator	1.20	6
Rad. heater (7 glower)	2.80	2 M per rad.
Gas iron	.24	1.2
Hot plates (2 burner)	.80	2 M per burner
Ironing machine	2.50	5 M
Space heater (yellow flame)	2.00	10
Gas steam radiator	4.00	20

3. Merchandise commission of 4% on cash selling price of all gas appliances.

4. Bonus for gas appliance salesmen of 5% additional on all merchandise sales in excess of $12,000 per year, payable yearly on gross installed sales for the period beginning July 1, 1927, or from the time of joining the sales force. Fifty per cent additional on all load-building commissions earned in excess of $350 per year payable yearly.

Note: The above bonuses are paid on installed sales.

Plan No. 3

1. Salary of $75 per month (and upwards, depending upon fitness, length of service and other qualifications).

2. Load-building commission or bonus on load-building appliance sales as follows:

Table of Load-building Bonus

Space heaters	$ .40
Cookers	.80
Ranges	.90
Tank heaters	1.00
Incinerators	1.50
Laundry	1.60
Refrigerators	2.60
Storage water heaters	3.30
Blue Star Homes	2.50

All subject to certain restrictions and conditions.

3. Merchandise commission of 11% on gross monthly sales in excess of $1,000 but less than $2,000.

4. Merchandise commission of 12% on gross monthly sales in excess of $2,000.

5. Merchandise bonus of 1% on all sales, completed by the salesmen individually on a strictly cash basis.

Plan No. 4

1. Salary of $75 per month.

2. Merchandise commissions based upon the "delivery only" price as follows:

15% on radiators, heatrolas, automatic water heaters, tank water heaters, radiant heaters, double service water heaters.

12% on garage heaters, dryers, ironers, incinerators.

10% on gas ranges, gas-fired refrigerators, laundry stoves, washers and Time-O-Stats.

Plan No. 5

1. A guaranteed minimum of $150 per month; (same for all sales divisions). (Should a representative's earned commissions fail to equal $150 for two consecutive months his guaranteed minimum becomes $90 until he again earns his way into the $150 class).

2. Load-building commissions varying in amount and percentage according to the gas revenue value of the equipment sold, taking into consideration annual gross revenue, annual net revenue and load-building characteristics, as follows:

Domestic Gas Division	*Load-Building Commissions*
Hot plate or laundry stove	$ .50
Cooker or non-heat control range	1.00
Oven heat control range	2.00
Clothes dryer	2.00
Removal of water-heating coil from house-heating furnace with installation of company-installed appliance	3.00
Approved fire-place or room heater	4.00
Incinerator	5.00
Water Heaters	
Manually-operated tank water heater	$2.00
Automatic storage water heater	
Less than 17 gals.	6.00
17 to 25 gals. inclusive	8.00
26 to 35 gals. inclusive	10.00
36 to 75 gals. inclusive	12.00
Over 75 gals.	14.00
For each domestic all-gas house-heating installation sold by the company and installed on representative's territory, on which domestic representative has rendered effective assistance, as evidenced by bonus claim approved by house-heating division	5.00
House-Heating Division	
For each domestic all-gas house-heating installation purchased from company and installed on house-heating representative's territory, where the equipment converts the customer's premises to all-gas heating	7.00
Commercial or Industrial Gas Divisions	
Of yearly increased Commercial or Industrial gas revenue estimated to accrue to the company under regular domestic rate, to be realized from sale of appliances and installations by company on industrial or commercial representative's territory	5%
Of yearly increased commercial or industrial gas revenue estimated to accrue to the company under shut-off-clause rate or dump-gas rate, to be realized from sales of appliances and installations by company on industrial or commercial representative's territory	2%

3. Merchandise commissions consisting of 40% of the merchandise gross profit realized on the sales of gas appliances and installations (same for all sales divisions).

Note: The merchandise gross profit is computed as follows:

The representative is credited with all charges to customers and salvage on returned appliances. The representative is debited with all costs of appliances including all freight, cartage and warehouse overhead expenses; also with all installation and delivery labor and material expense and overhead; also all allowances made customers for returned appliances and adjustments of disputes, and cash discounts; also with all removal expense on returned appliances such as disconnecting labor, material and cartage; also with all "no-charge" or "free" work orders such as measuring up and estimating expenses and gratuitous re-installing of unsatisfactory jobs. The difference between the sums of the credits and the debits is the gross profit upon which the representative receives a 40% commission.

4. Down-payment commissions of 5% of all cash down-payments collected in advance of the filing of orders for delivery or execution (same for all sales divisions).

Plan No. 5 differs radically from other plans reported as in use by member companies in that it pays no commission on merchandise sales, the merchandise commission being paid upon merchandise profit. The operation of this plan was described in detail in the August, 1929, issue of the *American Gas Association Monthly*, page 477, and appears to be producing the desired results.

In setting up the load-building commissions for such a schedule a careful analysis must first be made of the revenue-producing value of each appliance or piece of equipment, as well as the load characteristics of its consumption. For instance, it might be ascertained in the domestic field that the replacement of a manually-operated tank water heater with an automatic storage water heater occasions an average yearly increased consumption of 29,000 cu.ft. of manufactured gas, the greater part of this consumption coming on the valley of the annual load curve.

Analysis should be made of the revenue-value and load characteristics of the increased gas consumption of many other appliances and gas usages, such as ranges, manually-operated water heaters, fireplace heaters, incinerators, laundry stoves, house-heating installations, and various commercial and industrial equipment. Revenue or load-building commissions and percentages should then be set up to direct automatically the efforts of the salesmen toward the desired objectives. Paying a portion of the merchandise gross profit to the salesman improves his ability to overcome customers' objections, surmount obstacles, better his selling technique and make himself a better business man. Under a straight merchandise commission there is a tendency on the part of most salesmen to feel that the merchandise they are handling is priced too high.

Experience with the merchandise gross-profit commission has brought out the fact that the salesmen under it urge the company to maintain proper selling prices, arguing that good salesmanship can overcome low-priced competition. The salesman can save many dollars per month by extreme care in estimating piping costs, in routing his orders, and in being a good trader. It is apparent that a much higher percentage can be paid upon gross merchandise profits than could be paid upon gross merchandise sales; also that much higher percentages can be paid the salesman whose commissions are charged against a drawing account from a zero-base than could be paid upon a salary-plus basis.

Under such a plan each representative is expected to be fully familiar with all costs of appliances, overhead, deliveries and installations, in order that he may know almost exactly what commission he may expect upon each transaction as negotiated. With a little experience he soon possesses an approximate idea of the commission in each instance without much time-wasting arithmetic. His efforts are automatically directed along load-building net-earnings lines.

As regards merchandising he finds himself in partnership with the company on a 40-60 basis and accordingly endeavors to make as few mis-estimates as possible on installation and delivery expenses and on warehouse salvage-values of returned appliances taken in on trade (such as coal furnaces, stoves, grates and old gas equipment).

(*Continued on Page 62*)

The Right and Wrong of RIGHT OF WAY PROCEDURE

By C. H. PROUTY

Manager, Land Department
Pacific Gas and Electric Company

EVERY public utility is confronted from time to time with the necessity of obtaining various right-of-way privileges for the extension of its transmission and distribution system. Whether the negotiations between the company's representative and the property owners leading to the acquisition of the desired rights result in the improvement of the company's public relations or a feeling of dissatisfaction and unfair treatment on the part of the property owner, depends, in a large measure, on how the business of securing the necessary contracts is set about.

Few people, other than those directly connected with a transmission project, probably give much, if any, thought to the amount of preliminary work that has to be done prior to the time when construction can actually start. While utilities operate on city streets and county roads under franchises granted by the governing bodies of those political subdivisions, such operations are confined almost entirely to their use for distribution facilities. In a transmission problem the shortest practicable route is desired, for economic reasons, and it seldom occurs that the route selected between the source of supply and the point of distribution can follow a public road, even if it were desirable to do so, as most county roads are laid out either along property subdivision lines or on meandering courses which would necessitate much greater lengths of line to reach the same objective. The necessity, therefore, of acquiring rights-of-way over private property becomes imperative.

Eminent Domain

The laws governing the operations of utilities in California recognize the economic necessity of projecting transmission lines across private properties in order to permit the extension of service to the public at a reasonable cost, and have provided for the acquisition of rights-of-way by "eminent domain proceedings." This method, however, is one which is used only after every effort has been made to reach an amicable settlement with the property owner, as it entails useless expense to both parties and usually results not only in unpleasant future relations but also in an unsatisfactory verdict handed down by 12 jurors less competent to determine the value of the rights than the parties directly concerned.

Preliminary Stages

Preliminary to the actual negotiations with the property owners several stages of the work must take place. The termini of a line being known, the first step consists of the selection of a preliminary location, which is usually done in the office by plotting a line on the U. S. G. S. topographical sheets of the area or other available maps, to determine the approximate distance, its position relative to future extensions to certain areas and to roads that can be used for inspection and maintenance, general topographical conditions, etc. This preliminary location is then taken into the field for study and adjustments to meet the local conditions which do not appear on the maps, namely, errors in topography, rocky formations, slides, poor soil conditions, crops, improvements, and other features. A final survey is then made establishing a center line with ties to property and division fences and such corners and monuments as necessary to definitely determine its location with respect to the individual ownerships. When this survey has been plotted, a search of the county records is made to determine ownerships and encumbrances. Final maps are then made showing all of the essential data and right-of-way forms are prepared for each respective parcel, together with forms for consents from anyone having any interest in the property, such as deeds of trust, mortgages, agreements, leases, etc. When all of this preliminary work has been accomplished the next and most important step is to contact and complete negotiations for the rights desired from all of the interested parties. This involves something more than merely driving to the property to interview an owner, for in the majority of cases the owners and others interested in the property do not actually live on those particular parcels of land. The first information as to their respective addresses is usually obtained through the courtesy of the tax collector's office in the various counties where a record of taxpayers' addresses is kept, while other sources of information are the telephone and local directories, farm bureaus, information obtained by interviewing tenants on neighboring properties, and sometimes by random inquiries at various hotels or stores in the towns nearest the property. The results of these investigations usually disclose the addresses to be widely scattered.

The Pacific Gas and Electric Company has just completed one of its largest projects ever undertaken by the gas department, that of bringing natural gas into the San Francisco metropolitan bay area, and also to Stockton and Sacramento.

Elusive Owners

The total length of these pipe lines, including a connecting line between the Coast and Valley systems, is 501.4 miles, of which 440 miles are on private rights-of-way, necessitating the acquisition of grants from 790 property owners. By property owners is meant, in this instance, separate properties, for in obtaining the signatures of all parties interested in the title to or encumbrances on property it was necessary to interview approximately three times that number. The average grant requires two signatures, exclusive of those to be obtained on the releases, and in a few instances as many as 12 signatures were necessary to complete the execution of one grant. Search for owners on these lines disclosed one owner in South America, another in Japan, several residing or traveling in Europe, others in various states and, of course, many widely scattered over the State of California. The problem, therefore, becomes not only one of obtaining the right-of-way when you have found your man, but also that of being able to make the proper contact

(*Continued on Page 66*)

An *Inducement* Rate Schedule

By JAMES F. POLLARD

TABLE NO. 1. SCHEDULE A. (GENERAL RATE.)

Rate	Net	Gross
500 cu. ft. or less	$ .75	$ .85
Next 1,500 cu. ft. per month per meter	1.50 per M.c.f.	1.60 per M.c.f.
Next 3,000 cu. ft. per month per meter	1 30 per M.c.f.	1.40 per M.c.f.
Next 5,000 cu. ft. per month per meter	1.05 per M.c.f.	1.15 per M.c.f
Next 30,000 cu. ft. per month per meter	1.05 per M.c.f.	1.05 per M.c.f.
Next 60,000 cu. ft. per month per meter	.95 per M.c.f.	.95 per M.c.f
Next 100,000 cu. ft. per month per meter	.80 per M.c.f.	.80 per M.c.f.
Next 300,000 cu. ft. per month per meter	.75 per M c.f.	.75 per M.c.f.
Next 500,000 cu. ft. per month per meter	.60 per M.c.f.	.60 per M.c.f.
Next 1,000,000 cu. ft. per month per meter	.55 per M.c.f.	.55 per M.c.f.
Over 2,000,000 cu. ft. per month per meter	.50 per M.c.f.	.50 per M.c.f.

Minimum Monthly Charge: $.75 net; $.85 gross.

Prompt Payment Discount: The difference between the net and gross rates above stated constitute a prompt payment discount where bills are paid in full within 10 days of their date.

TABLE NO. 2. COMMERCIAL GAS SERVICE (OPTIONAL). SCHEDULE C-1.

Rate	Net	Gross
First 10,000 cu. ft. or less per month per meter	$10.00	$10.50
Next 90,000 cu. ft. per month per meter	.90 per M.c.f.	.95 per M.c.f.
Over 100,000 cu. ft. per month per meter	.80 per M.c.f.	.80 per M.c.f.

Minimum Bill: The minimum monthly charge shall be $10.00 net; $10.50 gross.

Special Terms and Conditions: A customer desiring service under this schedule shall make written application to the company and contract for such service on an annual basis.

TABLE NO. 3. COMMERCIAL GAS SERVICE (OPTIONAL). SCHEDULE C-2.

Rate	Net	Gross
First 25,000 cu. ft. or less per month per meter	$25.00	$26.00
Next 75,000 cu. ft. per month per meter	.80 per M.c.f.	.85 per M.c.f.
Next 100,000 cu ft. per month per meter	.75 per M.c.f.	.75 per M.c.f.
Next 200,000 cu. ft. per month per meter	.70 per M.c.f.	.70 per M.c.f.
Over 400,000 cu. ft. per month per meter	.60 per M.c.f.	.60 per M.c.f.

Minimum Bill: The minimum monthly charge shall be $25.00 net; $26 00 gross.

Special Terms and Conditions: A customer desiring service under this schedule shall make written application to the company and contract for such service on an annual basis.

TABLE NO. 4. COMMERCIAL GAS SERVICE (OPTIONAL). SCHEDULE C-3.

Rate	Net	Gross
Service Charge—per month per meter	$1.00	$1.10
Commodity Charge:		
First 50 hours use of maximum hourly use	$1.00 per M.c.f.	$1.10 per M.c.f.
Next 100 hours use of maximum hourly use	.75 per M c.f.	.75 per M.c.f.
Next 100 hours use of maximum hourly use	.60 per M.c.f.	.60 per M.c.f.
Over 250 hours use of maximum hourly use	.50 per M.c.f.	.50 per M.c.f.

Minimum Bill: The minimum monthly charge shall be $10.00 net; $10.50 gross.

Special Terms and Conditions:

(1) A customer desiring service under this schedule shall make written application to the Company and contract for such service on an annual basis.

(2) Maximum hourly use shall be computed to the nearest 50 cu. ft. and at the option of the Company be arrived at by either of the following methods:

(a) Actual measurement. Twice the maximum 30-minute usage as disclosed by actual measurement.

(b) 75 per cent of the combined hourly rating of installed equipment.

(3) Maximum hourly use shall, in no case, be less than 250 cu. ft.

OPTIONAL rates to stimulate gas sales have been adopted by the Seattle Gas Company as the best expedient for building up the gas business in this Northwestern community.

Faced with the fact that this is not an appropriate time to readjust rate schedules in any way that might result in the increase of rates to some customers, and at the same time confronted with the necessity of offering inducement rates to build up its volume of business without material loss of present revenue, the company decided to institute a complete series of optional schedules for all classes of business.

To all intents and purposes the company has had just two rates in effect heretofore. The first of these, known as Schedule A, was a general rate for gas for all purposes, including domestic, commercial, industrial and some house heating. This schedule is set forth in Table No. 1.

In addition to this general schedule the company also had an optional house heating rate which was of the service plus commodity rate type and called for a service charge of $2.50 per meter per month for 12 months in the year, and 65c per thousand cubic feet of gas used in addition to the service charge.

There were a few other minor schedules which were in effect, but more than 95 per cent of the company's business was on these two general schedules which will be continued in effect for all customers until they select and qualify for one of the new optional schedules.

In the domestic field a new schedule has been designed to induce use of additional appliances. It is available to all customers for domestic purposes, provided they have two or more major appliances. Major appliances are defined as gas ranges, gas refrigerators, gas water heaters and space heaters, for the purposes of this schedule. The rate will be $1.00 per month for the first 100 cubic feet or less; $1.25 per M.c.f. for the next 1,900 cubic feet; and $ .95 per M.c.f. for all over 2,000 cubic feet per meter per month. The customer must apply for this rate and sign a contract for at least 12 months. It should be a big stimulus for sales of additional appliances, compared with the former rate, which required the use of 40,000 cubic feet before it went below $1.05 per thousand and 5,000 cubic feet before it went below $1.30 per thousand.

With an average of 4868 degree days in Seattle and a heating season which lasts from the first of October well into the first part of July, we believe that we should have an opportunity to build up an excellent house heating load, with the right rate structure. At the present time we have approximately 700 house heating customers secured under the old rate, and in order to induce additional house-heating business we have refiled our new house heating schedules under two classifications.

The first of these new schedules is an individual house heating rate for any kind of house heating appliance on a separate meter. This rate can be applied to such local appliances as floor furnaces, cabinet heaters, radiant type heaters, etc., as well as to central house heating jobs. It calls for a monthly service charge of $1.75, which service charge is entirely waived during the

in Seattle

General Manager,
Seattle Gas Company

three summer months—July, August and September. In addition to the service charge, the net rate for gas used will be 60c per M.c.f. for the first 10,000 cubic feet per month, and 55c per M.c.f. for all over 10,000 cubic feet per month. Under the former house-heating optional rate, the $2.50 service charge was applied to every month in the year, and, while it was a combination rate for house heating and domestic service, it was applicable only if the customer had a central house heating job. This new rate is designed to stimulate a lot of interest in auxiliary house heating appliances, as well as larger central installation jobs.

James F. Pollard

The other house heating rate which the company is filing is designed to take care of combination house heating and domestic service business. It will call for a service charge of $2.50 per month for all of the months of the year, except July, August and September, when the service charge is reduced to $1.00 per month. If this rate is applied to house heating alone, it will continue to be 65c per M.c.f. for all gas used, but if one major domestic appliance is added to the house heating there will be a 5 per cent discount from the commodity charge of 65c per thousand. If two major appliances are combined, the discount will be 10 per cent on the commodity charge. And if three major appliances are combined, the discount will be 12½ per cent from the commodity charge.

In order to take care of commercial customers, such as restaurants, hotels, bakeries, etc., three optional commercial schedules are being offered, as shown in Table No. 2, Table No. 3, and Table No. 4.

For high load factor industrial customers, a very attractive load factor type of industrial rate is being offered. This rate is being designated as Schedule I-1 and is given in Table No. 5.

TABLE NO. 5. INDUSTRIAL GAS SERVICE (OPTIONAL). SCHEDULE I-1.

Rate	Net	Gross
Maximum Hourly Use Charge:		
First 300 cu. ft. or less of maximum hourly use, per month	$15.00	$16.00
Over 300 cu. ft. max. hourly use per month, per 100 cu. ft.	2.00	2.00
Commodity Charge:		
First 100,000 cu. ft. per month per meter	.60 per M.c.f.	.65 per M.c.f.
Over 100,000 cu. ft. per month per meter	.45 per M.c.f.	.45 per M.c.f.

Minimum Bill

The minimum monthly charge shall be $25.00 net; $26.00 gross.

Special Terms and Conditions

(1) A customer desiring service under this schedule shall make written application to the company and contract for such service on an annual basis.

(2) Maximum hourly use shall be determined as follows: Three separate 30-minute readings shall be taken during the time when the customer's maximum use of equipment is to be expected. The sum of the two lowest of said three 30-minute readings shall be considered as the maximum hourly use.

(3) A maximum hourly use, once established, shall not be exchanged during the term of the contract unless the amount of the customer's equipment, or its use is increased, in which case a new determination of maximum hourly use shall be made and any higher determination be used as the basis of billing for the remainder of the contract. On renewals of this contract, the maximum hourly use shall not be taken at less than 75 per cent of that billed during the preceding 12 months.

TABLE NO. 6. LARGE INDUSTRIAL GAS SERVICE (OPTIONAL). SCHEDULE I-2.

Rate	Net	Gross
Maximum Hourly Use Charge:		
First 5,000 cu. ft. or less of maximum hourly use per month per meter	$165.00	$170.00
Over 5,000 cu. ft. of maximum hourly use per month, per 100 cu. ft.	1.00	1.00
Commodity Charge:		
First 100,000 cu. ft. per month per meter	.60 per M.c.f.	.65 per M.c.f.
Next 400,000 cu. ft. per month per meter	.50 per M.c.f.	.50 per M.c.f.
Over 500,000 cu. ft. per month per meter	.40 per M.c.f.	.40 per M.c.f.

Oil Clause

For a change of ½c per gallon in the price of gas oil, delivered into the company's tanks at its plant, above 3½c or below 2½c, the Commodity Charge as above shall be increased or decreased, respectively 1c per 1000 cu. ft.

Fuel Clauses

Carbonizing Fuel: For a change of $1.00 per net ton in the price of carbonizing fuel, delivered in the pany's bins at its plant, above $4.50 per net ton or below $3.50 per net ton, the Commodity Charge shall be increased or decreased, respectively 1c per 1000 cu. ft. Said adjustment shall be proportionate to fractional changes of the base above or below said limits.

Carbonizing Fuel: For a change of $1.00 per net ton in the price of carbonizing fuel, delivered in the company's bins at its plant, above $5.50 per net ton or below $4.50 per net ton, the Commodity Charge shall be increased or decreased respectively 1c per 1000 cu. ft. Said adjustment shall be proportionate to fractional changes of the base above or below said limits.

Minimum Bill

The minimum monthly charge shall be $500.00 per month.

Special Terms and Conditions

(1) In order to determine the Maximum Hourly Use, four separate half-hour readings shall be taken, not closer than ½ hour, during the normal use of the customer's equipment at such time as maximum usage might be expected. These four readings shall be arranged in order of magnitude and the two highest neglected. The sum of the next two shall be considered the Maximum Hourly Use. Such Maximum Hourly Use shall be used as the basis of billing for the period of the contract unless the amount of the equipment, or its use, is increased, in which case a new determination shall be made and such new determination thereafter be used as the basis of billing.

(2) If any customer uses more than 25 per cent of his total gas consumption during the off-peak hours (generally 6 P.M. to 6 A.M.) the Maximum Use Charge shall be reduced in the ratio that such night use bears to the 24-hour use.

(3) This rate shall apply only on contract for a period of 5 years, renewable annually thereafter.

(4) If the monthly consumption exceeds 2,000,000 cu. ft., the Consumption Charge for that month shall be reduced 5 per cent.

For very large industrial customers with a good load factor, a still more attractive rate is offered under the caption, Schedule I-2, as detailed in Table No. 6.

In order to enable the company to break into the water heating field in apartment houses and office buildings, where the water is heated in the winter time by coils in steam heating plants, virtually the same rate as offered to the domestic householder for space heating on the separate meter plan is also being offered to apartment houses and office buildings under the heading CH-1 for Space Heating and Summer Water Heating. In the case of these customers however, they must sign an annual contract, specifying the months during the year when heat will be used, which months must include those of July, August and September and as many more as they may desire. In this case the $1.75 service charge will apply during the months when the service is used and a $10.00 monthly minimum is required. The rate will be 60c per thousand cubic feet for the first 10,000 per month, and 55c for all over 10,000 cu. ft. per month.

The new optional heating rates are being substituted for the old optional heating rates and notice is being mailed to each individual customer, asking for a list of his appliances and asking him to apply for either the separate meter rate

(*Continued on Page 43*)

Change-Over *to* Gas *for* This Gray

By WALTER E. LIND

THE conversion of an industry to the use of gas for fuel purposes is usually extremely satisfactory, but seldom quite so gratifying as in the case of the H. C. Macaulay Foundry Company in Berkeley, California. This plant, one of the foremost gray iron foundries on the west coast and capable of producing over 50 tons of castings per day, has long been known for the service it renders and the quality of the product turned out. Conservative, but whole-heartedly willing to participate in changes that are convincingly practical and economical, the practices and policies of this firm are accepted as standard by similar enterprises, and as a consequence the complete change-over from other fuels to the use of gas for baking cores and drying molds has been of inestimable value to the gas industry in the surrounding area.

Walter E. Lind

While this conversion has been of great value as a testimonial of the quality of gas fuel, it has also been of even greater value to the user. Not only has there been a direct saving in fuel costs, but there have been savings resulting from elimination of labor and reduction of spoilage. Production has been speeded up and in the case of emergency orders, quicker deliveries can now be made; working conditions have been improved and more uniform results have been made possible. Then, too, there has been a considerable saving in floor space in having work move faster through the shop and through the elimination of storage of fuel and space for stoking and cleaning fires. This last item is of considerable importance to factories paying high rentals in our cities.

However, it was necessary to prove to the foundry company that gas is the superior fuel, and the pair of "day" ovens shown in Fig. 1 were used to make the demonstration. These ovens, each about 4 feet square inside, were originally heated by coke in a single fire-box located between and below them, and were used to bake complicated oil-sand cores for automobile engine cylinder heads. The first step in the conversion was the isolation of each oven by closing up the openings to the fire-box, leaving only a small space at the top of each oven for the burned gases to vent out through the stack. Each oven was then provided with a separate burner manifold of 2-inch pipe placed on the concrete floor underneath the lower drawer, which was protected by a suitable baffle plate. The air-gas mixture was provided by a venturi type atmospheric mixer using gas at 1 pound pressure, the gas flow being controlled by a snap-action type thermostat set to maintain the oven temperature at about 450° F.

THE results were satisfactory from the start. The uniform controlled heat eliminated the turning and moving of heavy cores and plates necessary with the old heating system, and it was no longer necessary to "bank" the ends of cores with shop sand to protect them from intense spotty heating. The time of baking was reduced nearly 50 per cent and burned or spoiled cores became a thing of the past. Before long a 20 per cent increase in the production of two coremakers was noted and it was eventually possible to add a third coremaker to the room—the gas installation handling this 65 per cent increased amount of cores with ease. These same coremakers became firm friends and boosters of gas immediately, due to

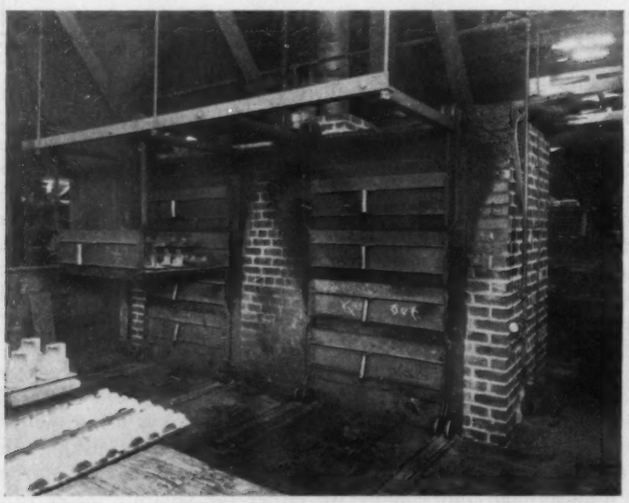


Fig. 1

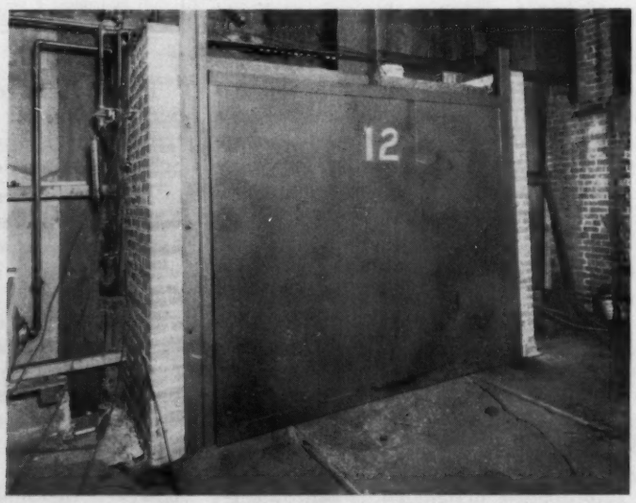


Fig. 2

Spells Economies Iron Foundry

Industrial Engineer
Pacific Gas and Electric Company

the creation of pleasanter working conditions and the lightening of their tasks. The operating cost with 550 B. t. u. gas was approximately $2.55 per day (3400 cu. ft. at 75c per M.), whereas the previous cost of heating with coke was approximately $3.10 per day (300 pounds at $14.00 per ton—kindling, firing and maintenance $1.00), which showed a direct saving in fuel cost in favor of the gas installation.

SHORTLY after this conversion an increase in activity made necessary the erection of an additional core-oven to handle both flour and oil sand cores of the so-called "jobbing" nature, and also molds and cores for a "production" order. This was an opportunity for a still more convincing demonstration through the design and construction of a gas-fired, insulated oven of the car type. The dimensions of this oven, shown in Fig. 2, were 8 feet by 12 feet by 7 feet 6 inches high; walls were constructed of 4½ inches of calcined insulating brick inside, with 9 inches of red brick outside; roof of 4½ inches of calcined insulating brick, carried on inverted T beams, with a topping of one course of red brick; floor was of 3-inch insulating concrete laid on top of a 4-inch concrete base. The lift door was built of steel plates and angles and was lined inside with 1½ inches of magnesia blocks plastered over with high-temperature cement, and was sand-sealed at the top when in the closed position. The application of the insulation to the inside of the oven was determined by the low temperature of the operation and the intermittent nature of the work, the oven being heated up only once each day. While the thicknesses of insulation used may seem somewhat excessive in view of operating conditions, they were in reality determined by structural demands. However, the justification for the expenditure of insulation (about $275.00 over and above the cost of ordinary construction) was found in the economies obtained in operation—the gas consumption per pound of cores being a great deal less than the usage in other uninsulated ovens.

The gas-burner equipment for this oven consisted of two 11-foot manifolds, each with 24½-inch screened tips, placed one each along either side of the oven at the floor. Venturi type mixers using gas at 1¼ pounds pressure supplied the air-gas mixture of nearly theoretical proportions, the slight amount of secondary air for complete burning, and for oxidizing cores, being provided through leakage under the door. Venting of the burned gases and vapors was accomplished through two rows each of three 2½-inch square holes spaced at equal centers in the roof of the oven, and opening directly to the atmosphere. A throttling type thermostat was used to maintain the oven temperature at about 400° F.

SOME very interesting test data were obtained on the operation of this oven used for the type of work shown in Fig. 3. The cores and molds were weighed in and out of the oven and a very close check made on temperatures and gas consumption. Table No. 1 gives the pertinent data from a representative run of a series of tests made with varying loads of cores and indicates that the unit cost of production can be kept very low through the proper design of equipment. In this case the unit cost of .838 cubic feet of gas per pound of cores is considerably less than the unit cost both in other coke-fired ovens and in similar uninsulated gas-fired ovens. The baking temperature of 400° F. was found to be most satisfactory for the general run of work in this oven, although for exceptional jobs it was some-

(*Continued on Page 56*)

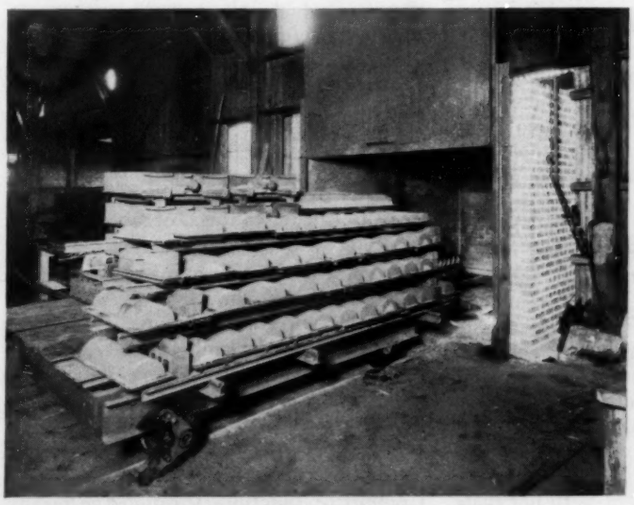


Fig. 3

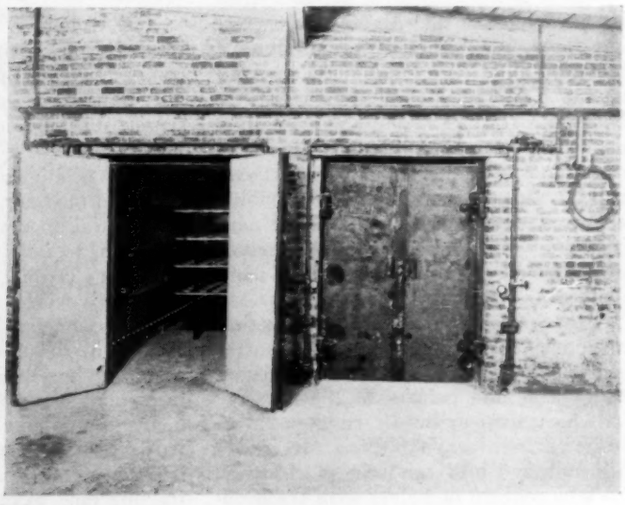


Fig. 4

Women's Committees *as* Morale Builders

By ADDISON B. DAY

President,
Los Angeles Gas and Electric Corporation

WOMEN have gone into the public utility business, along with the other businesses and the professions which they have adopted as their proper sphere of activity. It is no part of the purpose of this brief statement to discuss the desirability or the value of its women employees to the industry. For our present purpose that may be taken for granted. But that the women are *in* and *of* the gas industry and the gas utility organizations is a fact; and it also is the starting point for our thinking on this subject of industrial women's committees.

Now what are the attributes and inhibitions that make it difficult for a woman employee, in contrast with a man in the same position, to deliver her full "rated output" of service in a gas utility organization? In other words, what special training and advantage does she need that a man doesn't; and does it pay the gas company to provide such training and advantage? And if the answer to the last clause of this question is "yes," how shall we proceed to work out a plan that will accomplish the desired result?

Heart Throbs and Dividends

When a woman enters a public utility organization as a unit of its operating force, we have the situation of a feminine mind in a mechanical environment. The terminology of the utility business is strange to her, and even after the words have been learned, they don't convey a very complete or very accurate mental picture to the woman who has always lived in a non-technical and non-industrial world. The gas industry is primarily an engineering enterprise; and women are not naturally engineers.

What difference does it make whether a woman employee, or for that matter any employee, understands the process, equipment, and policies of the industry in which she—or he—is employed? A ledger is a ledger, a file is a file, and a bill stub is a bill stub—the world over. So why concern ourselves with the problem of whether the individual employee does or does not understand the origins, purposes and significance of the forms with which she works?

Every industrial manager of the present economic era recognizes the primary value to his organization of the thing called "morale" or *"esprit de corps."* It is the spirit, permeating and dominating both the managerial staff and the rank and file, which makes of the whole a living, co-ordinating body, with the consciousness of a common purpose and destiny, and the soul of a common loyalty to the Institution; or else, failing, leaves the individual to the discontent of a drab and uninteresting existence, and the institution an easy prey to dissension within and to the corroding acid of attack and criticism from without.

This does not mean that the modern manager is utterly selfish in his attempt to build up good employee relations. Quite the contrary. Most executives would gladly encourage their people in self-improvement on the single ground that it is the decent and human and satisfying thing to do. But there exists a sound business reason, also, for cultivating the good-will crop; and the man behind the plate glass door is ever conscious of the close relationship existing between heart-throbs and dividends.

The woman who enters the ranks of employment in an operating gas utility comes as "a stranger in a strange land." An important educational and social service must be done for her before she really "belongs." The average male employee has a good initial grasp of the facts and mechanics of industry; and has the natural opportunity, if he has the inclination, to investigate and find out to his heart's content—for the gas industry is a man's world. But the woman who would become an intelligent and capable worker in the craft must have help in orienting herself in the institution and in forming a mental picture of what the institution is like; and she must ordinarily have a liberal amount of such assistance before she is even up to the starting tape, as compared with her male co-worker.

This same relative handicap of women in assimilating with the institution exists also on the social side. The "new girl" on the billing machine or the file desk has a very restricted social horizon; and it is important that it should be broadened—important to the company, as well as to the employee. Every tension which is impressed upon the worker's nervous system by reason of the strangeness of the environment or uncertainty as to the reception which she will receive from fellow-employees, is an added cause of fatigue and is detrimental alike to morale and output; and all reasonable effort should be made to remove such mental strains as quickly and completely as possible.

"Graduate" Employees

Not only for the tenure of the woman's employment by the utility are the good results of such educational and social development in evidence. Every properly trained and generously treated woman employee who resigns her job to assume the management of her own home becomes automatically and inevitably a booster for the company and a defender of its policies, simply because she has been educated into a sympathetic understanding of its attitude and motives. Such "graduate" women employees become neighborhood centers for the radiation of good-will for the institution which was so fortunate as to have employed them and so wise as to have made the term of their service pleasant and instructive.

Why the Women's Committee?

What is the best means for providing the social and educational facilities which women employees need? In our own organization we have had four years of very satisfactory experience with the "Women's Committee"—that rapidly developing personnel agency of the gas and electric utility associations.

We find that the Women's Committee has many advantages. It provides facilities for instruction and recreation, gets the women together on a friendly basis, reveals talents that otherwise would remain undiscovered and develops qualities of leadership which frequently it is to the advantage of the management to know about.

Committee work commands the interest of women because it enables them to do for themselves and appeals to their creative instincts; and, moreover, being a voluntary and cooperative enterprise, it is free from the curse of professionalism and paternalism which so often adheres to paid "welfare" effort.

In our organization the Women's Committee functions through the means

(*Continued on Page 43*)

One Company's Experience with

Gas Appliance Servicing

By C. E. SHERBURNE

*Oklahoma Natural Gas Corporation, Oklahoma City**

OUR company, like many others, maintains a free service department which is subject to call at any time during the day or night.

As a check of our service work, to assure ourselves that the customer is satisfied, a follow-up card is mailed to the customer after the call is completed. The reply card, which is self-addressed and stamped, has a brief form which the customer may check to indicate whether or not his request for service was met satisfactorily.

Recently we made a check of 2,000 of these cards which had been sent out. Of the 2000 we received reply from 528. Of the 528, only 28 were unsatisfactory, or 5.3 per cent. If we assume that the "no replies" were satisfactory, then only 1.4 per cent of the 2000 service calls were unsatisfactory.

In many cases the customer not only indicates that the service request was taken care of to his entire satisfaction, but under the heading, "Remarks," the customer expresses appreciation for service rendered.

We feel that these cards not only give us an absolute check in our service department, but show that we have a personal interest in seeing that the customer gets the best possible results from the gas used. For one thing, they enable us to analyze our complaints very closely.

The three most common complaints we receive are caused by wall sweating, high bills and fumes, due to incomplete combustion. I will cover the reasons for these conditions and our procedure in handling them separately in the order named.

WALL SWEATING

Hydrocarbons burn in the presence of the oxygen of the air to form carbon dioxide and water vapor, the amount of the products varying with the composition of the fuel.

During the process of the combustion of the gas of this locality, approximately 11 gallons of water in vapor form are released into the room for each 1,000 cubic feet of gas burned.

If it were possible to burn coal or oil without a vent, the same wall sweating or condensation would take place.

The air in a room can be compared to a sponge. It has the ability to absorb moisture varying with its temperature. When the air from a warm room, containing the moisture from unvented or improperly vented appliances, reaches the cold outer walls, it gives up a portion of its moisture, which is left on the wall.

As this moisture is a natural product of combustion, the only two possible ways of eliminating wall sweating are: Venting the products of combustion out of the room or allowing enough fresh air to enter the room to absorb this surplus moisture.

A few of the conditions we have found to cause wall sweating are as follows:

(1) Too many appliances vented into one chimney.

(2) Too small an outlet at heater to carry off the products of combustion.

(3) Too small a flue between heater and chimney.

(4) A long vent passing through a cold room into a cold chimney. This will cause the products to chill and stop circulation.

(5) A plugged chimney, caused by birds nests, brick falling inside, ashes from an incinerator, etc.

(6) Chimneys lower than adjoining buildings or trees causing a down draft.

(7) Appliances not vented.

(8) Crowding heaters, trying to heat room quickly.

As the public has been sold on brass piping, base plugs, insulation, weather stripping and other means of comfort and efficiency, they why cannot we cooperate more with the architects and builders, and in homes where central heating plants are not specified, have enough flues installed to properly take care of the space heaters required.

HIGH BILLS

Our usual procedure in checking a high bill complaint is as follows:

(1) The house piping and meter are checked for leakage, and the meter reading verified.

C. E. Sherburne

(2) The appliances checked for efficiency and adjusted, and if they are of an obsolete type, the proper type for the service in question are recommended.

(3) The house construction is checked. In some cases high bill complaints can be traced to faulty house construction. If the appliances are vented, we recommend weather stripping, as this will effect a material savings in gas consumption. If it is impossible to vent the open flame heaters in a home, it is not advisable to recommend weather stripping, as the eliminating of these fresh air inlets will greatly increase wall sweating.

(4) A load check is made and compared with the month's consumption. Then a check of the living habits of the family is made. Often a new radio or sickness will account for an increase in the consumption of gas.

(5) If, by these different investigations, the customer has not been convinced that the bill is correct, the meter is changed and taken to the meter shop and tested, in the presence of the customer, for its accuracy. This, however, should be the last resort, as it is very seldom that a meter is fast enough to cause a high bill complaint.

Often complaints are caused by the consumer comparing his current month bill with the same month of the previous year or the previous month of that of some friend of his in a different section of the city with the same size home, family and living habits.

In answering these complaints a record of the degree days in the past and present heating season is essential.

In Oklahoma City, District No. 17 is read on the 10th of each month and District No. 3 is read on the 17th of each month. For the meter reading period of District No. 17, we had 787 degree days during the past heating season.

(*Continued on Page 58*)

*Extracts from a paper presented before the gas division of the Oklahoma Utilities Association at the 1930 annual convention, Tulsa, Oklahoma.

PACIFIC COAST GAS ASSOCIATION

447 Sutter Street, San Francisco, California
A Department Conducted by Clifford Johnstone, Managing Director

Tentative Accounting Section Program

R. A. HORNBY, *Chairman*
Southern California Gas Company

COMMITTEE on *Revision of Customers' Deposits General Order:* It is planned that this committee will be a small one, and will be the direct representatives of all of the member companies in California, for the purpose of making some definite recommendations to the Railroad Commission of the State of California for the revision of the general order covering the extension of credit and the taking of consumers' deposits. It is planned that the respective committee members will first have called for an expression of opinion from each company in their areas and then approach the commission with a request for a discussion of the committee's conclusions.

R. A. Hornby

Destruction of Records Committee: It is planned that this work will be continued under the leadership of Mr. Kelly of the Pacific Gas and Electric Company, with the suggestion that he propose the creation of a preservation and destruction of records committee within each of the companies, the chairmen of which committees will be the representatives of their companies on the Pacific Coast Gas Association committee.

Fixed Capital Records Committee: It is planned that this will be the fourth edition of the Association's activities in attempting to set up examples of complete routine for the maintenance of fixed property records. This committee will be under the direction of the previous year's chairman, R. W. Baily of the Southern California Gas Company, and will take up one or two of the remaining subjects outlined in the 1929 report covering work orders, property ledger and staff.

Stores Accounting Special Problems Committee: It is planned that this committee shall devote itself to individual problems, which may be added to by any of the companies. Those that are now included in the list for possible study are: accounting for fitters wagon stock; accounting for material received before invoices and invoices received before material; accounting for materials returned to stores as a unit but subsequently broken up into parts; accounting for pipe returned to stores, part of which is subsequently salvaged; accounting for protective coverings applied in the yard prior to the issuing of the pipe from stores.

It is suggested that the companies' accounting representatives come to the November meeting in San Francisco prepared to state which problems they are interested in and with suggestions for additional ones, if any.

Haulage Accounting Committee: It is planned to have this committee study the methods and the problems involved in the distribution of haulage expense, not only in construction but also in operating expenses. It is planned to have this committee under the chairmanship of G. W. Mackenzie of the Portland Gas & Coke Company. It is the intention to specifically instruct the committee to investigate certain special problems on haulage, and it is therefore recommended that the companies' representatives be prepared with suggestions at the November regional meeting.

Classification of Accounts for Natural Gas Properties Committee: If the American Gas Association adopts a classification of accounts it may be desirable to have the California companies review this classification as a committee, with the possibility of approaching the commission for amplification of the existing commission classification.

Division Purchases and Disbursements Committee: If there are sufficient number of companies interested, there will be a committee on this specific subject which will render a report showing the different systems employed in making purchases of emergency materials, the kinds of materials that may be purchased in the divisions, the method of handling payments for other utilities services, the method of payment for special jobs and the types of district funds, check or draft used to make the payments. It will not be the plan to have the committee make any recommendations.

General: It is the intention that if any other committees are appointed, they will be special problems committees, and that the committee chairmen who will be appointed after the November meeting will receive definite instructions as to the nature of the problems to be studied, and as to whether the committees' reports shall be in the nature of a review and study, and whether they will be expected to make definite conclusions and recommendations.

Commercial Section Organization

H. M. CRAWFORD, *Chairman*
Pacific Gas and Electric Company

THE Commercial Section this year will be organized into two general divisions, the first dealing with the domestic uses of gas, including appliance merchandising and the promotion of sales in cooking, water heating and house heating, and the second dealing with the sale of gas for commercial and industrial purposes, including commercial cooking and general industrial and factory sales.

The Domestic Sales Committee will be under the chairmanship of F. M.

Banks, general superintendent of sales, Southern California Gas Company, Los Angeles, and the Industrial Sales Committee will be under the chairmanship of C. R. Miller, superintendent of utilization, Portland Gas & Coke Company, Portland, Oregon.

A subdivision of the Industrial Sales Committee dealing with the more technical aspects of industrial gas utilization and burner design will be in charge of J. H. Gumz, industrial engineer of the Pacific Gas and Electric Company.

In addition to these two general divisions of the Commercial Section's program a number of special problems of timely importance will be discussed at the meeting of the Section to be held in San Francisco, November 20 and 21, and it is probable that a decision will be reached to appoint special committees in connection with their study. Among these are the question of maintenance service on customers' gas appliances, a study of the present policy of companies in regard to gas extensions as they affect the acquisition of new business, the education of salesmen, the practices employed by some companies in gaining employee cooperation in securing prospects by giving bonuses, etc., and the organization of a comprehensive market survey.

One very important innovation which the Commercial Section hopes to bring about is the calling of a "Summer Conference" of sales executives by having a small group of men, each of whom is actually in charge of building sales plans for his company congregate at some time during the dull season for a several days' conference on their contemplated plans for the development of new gas business for the ensuing year. Practically all angles of our sales problems could be brought out effectively with the result that each company would gain the benefit of a full discussion and each executive would acquire ideas which would be useful to him in his own work.

H. M. Crawford

Preliminary Public Relations Plans

Geo. L. Myers, *Chairman*
Portland Gas & Coke Company

THE Public Relations Section at the meeting of the Executive Committee in San Francisco, November 21, will definitely determine upon the policies to be followed during the current Association year and the nature of its program at the next annual convention.

Geo. L. Myers

The committees which functioned during the Association year 1929-1930, namely Executive Committee, Customer Ownership Committee, Committee on Employees' Relations with the Industry, Committee on Employees' Relations with the Public, and Women's Committee, will be continued.

The following chairmen have been appointed: E. C. Cox, Southern Counties Gas Company, Los Angeles, Customer Ownership Committee; B. H. Parkinson, Portland Gas & Coke Company, Portland, Committee on Employees' Relations with the Industry; and Miss Clarita Scott, Los Angeles Gas and Electric Corporation, Los Angeles, Women's Committee.

A Committee on Relations with Customers will function during the present Association year. This committee will have a personnel consisting of representatives from member companies to report practices and policies of interest and benefit existent among member companies pertaining to service relations with customers which help to develop good will. O. L. Moore, Los Angeles Gas and Electric Corporation, Los Angeles, has ben appointed chairman.

The Executive Committee at its meeting in November will decide upon whether public speaking contests and an essay contest are to be conducted. The committee has expressed an opinion that it might be well to hold these contests biennially, with the public speaking contests featured one year and the essay contest the other year. The Committee on Employees' Relations with the Public, which conducts these contests, has gone on record in favor of holding all contests each year. The chairmanship of the Committee on Employees' Relations with the Public has not been provided, but will be prior to the San Francisco meeting. It is planned to continue the Stunts Presentations. Each contest will have a director as well as a Director of Stunts Presentations. The subject of each contest to be held will be decided at the San Francisco meeting, as well as a theme or general subject for Stunts Presentation.

The Executive Committee will pass upon the suggestion of providing for an Educational Committee. The purpose of such a committee would be to ascertain what member companies have done or are doing in providing educational courses and to study and survey those courses so as to be helpful in recommending improvements upon existing courses and to provide information for those companies which desire to institute educational courses. Such a committee could be made particularly helpful in evolving courses of a nature that can be readily understood so as to bring about a proper understanding of the economic and political facts which govern in the functioning of the industry. It is most important that something constructive be done by all member companies in getting employees fully informed so that in their many contacts with the public they may be able to intelligently and effectively impart information and at the same time build up their interest and efficiency. The industry's progress is dependent upon public sentiment, and public sentiment is dependent upon public understanding. An informed and interested personnel can be a most effective means of promoting public understanding. The editors of member company employee publications should have a part in the work of such a committee in order to be helpful through such publications. The cooperation of the Women's Committee can be helpful in developing the fullest possibilities of employee education.

Relations with customers in providing service and employee education through organized cooperative efforts among member companies in effective committee representation will be new endeavors of the Section for the current Association year and will be of outstanding consideration at the San Francisco meeting.

The Section should also give consideration to cooperation in the work of the new Publicity and Advertising Section. That Section's functions have a most important relationship to public relations activities.

The program of activities for the Public Relations Section this year is of sufficient importance and scope to enlist the willing and active cooperation of member companies.

Publicity and Advertising Section

WALTER D. THURBER, *Chairman*
Southern Counties Gas Company

THE newly created Publicity and Advertising Section will be launched officially at the time of the Regional Conference in San Francisco in November. At that time the Section's executive committee will be asked to ratify the first-year program and to approve the appointment of sub-committee chairmen who will carry on the Section activities.

Walter D. Thurber

While the executive committee will be composed, largely, of the advertising managers of P.C.G.A. member companies, the chairman is reaching out into all branches of the industry for personnel to man the several committees. Leaders in technical, commercial, accounting, public relations, and other specialized interests will meet on the common ground of advertising and publicity, if the hopes of the chairman materialize.

The tentative work-program for the Section, to be considered by the executive committee at San Francisco, includes coast-wide and national studies of gas utility advertising practices and policies; specialized studies of institutional and merchandise advertising; preparation of sample news and feature material; a reference bulletin on points of special interest to the industry; monthly exchange of advertising material issued by member companies; preparation of an exhibit for the 1931 Convention, and cooperation with the corresponding Section in the American Gas Association.

Executives of P.C.G.A. member companies—up to the time of this advance report—have nominated the following representatives on the Section's executive committee: Pacific Gas and Electric Co., Al C. Joy; Los Angeles Gas and Electric Corp., Eugene P. Ramsay; Seattle Gas Company, P. A. Brattain; San Diego Consolidated Gas & Electric Company, F. M. Raymond; Southern California Gas Company, F. H. Holden; Spokane Gas & Fuel Company, A. A. Salmon; Arizona Edison Company, E. A. Thomas; Santa Maria Gas Company, Ralph Phelps; Northwest Cities Gas Company, H. M. Thomas; Sierra Pacific Power Company, O. S. Clifford; Tuscon Gas, Electric Light & Power Company, A. E. Morrison; Turlock Gas Company, A. A. Caldwell; Coast Counties Gas & Electric Company, Miss Alma Freeburg.

Technical Section Has Full Schedule

W. M. HENDERSON, *Chairman*
Los Angeles Gas and Electric Corporation

THE Technical Section has completed its organization and adopted a program for Committee activities:

W. M. Henderson, Chairman; W. F. Pape, Vice-Chairman; J. S. Holt, Vice-Chairman.

Production Committee: N. H. Wardale, Chairman.

Natural Gas and Transmission Committee: Elting Henderson, Chairman.

Distribution Committee: D. H. Perkins, Chairman.

The complete personnel of chairmen and members of the various sub-committees has not all been selected, but—it will not be long now.

The outline for the committee activities is complete, and the chairmanship in most cases either accepted or now under consideration.

W. M. Henderson

The activities which will be undertaken during this term are in some few cases continued from last year, together with a number of new problems that are of immediate interest to the industry. They are as follows:

Production Committee:

Sub-committee subjects:

1. Plant Fire Protection and Housekeeping. To consider the various fire extinguishers' equipment now offered industrial plants. To outline the benefits from good "housekeeping," and to promote interest in such a practice.
2. Plant Corrosion (Continued).
3. Water-Gas Development. Recent improvements in automatic control, and progress and accomplishments with short cycles.
4. Butane for Peak Load Production. A study of results and methods used where butane serves as stand-by for peak loads.
5. Economies of Sulphur Removal. A study of the effect of various concentrations of sulphur dioxide in stack gases on the rate of corrosion caused by gas combustion products.

This is a subject of interest to utilization engineers and plant chemists. It may include an investigation of various corrosion-resisting alloys.

6. Instruments Used in Manufacturing Gas. Calorimeters and the Gas Density Meter as an indicator of heat values. Automatic control of gas generators.

Control and measurement of steam.

Temperature and Pressure Regulation.

Blast Air Control.

Automatic Operation of Steam Boilers.

Natural Gas and Transmission Committee:

Sub-committee subjects:

1. Compressor Stations.

(a) A study and actual field tests to determine horse power to compress gas.

(b) Complete the report on air cleaners for gas engines.

(c) To observe the efficiency of compressor units operated at various jacket water temperatures.

2. Measurement. To complete study to determine the proper method to observe temperature of gas for measurement purposes.
3. Transmission.

Station Piping Design—meters and governors.

Reconditioning Lines.

Movement of pipe in the sub-soil, and the use of expansion joints.

Comparison of time, strength, and cost of electric and gas welds.

Apparatus for determining free water contents in gas.

Distribution Committee:

Sub-committee subjects:

1. Distribution Design.

To carry on the work heretofore submitted.

To make a study of Street Improvement Laws and their effect on distribution installations.

To study traffic vibrations and their effect on substructures.

2. Meters and Meter Statistics.

To consider the utility, design and installation of curb meters.

To publish a record of meter proof as reported by the member companies.

3. Governor and Regulator Capacities. To continue the work of the former committee and complete the results of investigation on domestic regulator performance.
4. Pipe Protection.

To interpret soil index studies and submit results from observations made in various soils of known characteristics.

To recommend the extent of protection necessary in various soils.

5. Utilization Design.

To submit design of installations, meters, regulators, burners, etc., for different industrial installations, including figures and engineering data.

6. Construction Practice and Units of Performance. Gather data on various types

of mechanical equipment and make a study of performance on the man-day basis for various standard tasks performed by labor in distribution work.

The outline indicates a fair-sized program. It is expected that the committee work will progress in some cases at sufficient speed to submit reports at regional meetings. This plan will relieve the presentation at the Annual Convention and allow more time for general discussion.

All committee chairmen are agreed on this policy: The value of committee work to the individual is measured by the extent to which he contributes, so every worker on the various committees in accepting assignment commits himself to being a producer.

The Women's Committee *as a* Morale Builder

(*Continued from Page 38*)

of plant visitation and luncheon meetings and also through called sessions during business hours. The business-hour sessions are usually 30 minutes in length. The luncheon meetings extend a half-hour over into "company time." For the present season, the management has agreed to share the luncheon cost of several of the monthly meetings, on the basis of two-thirds of the luncheon check by the Corporation and one-third by the employee.

Our own Women's Committee has the encouragement of the management, for in it we see a valuable builder of efficiency and morale.

An Inducement Rate Set Up *in* Seattle

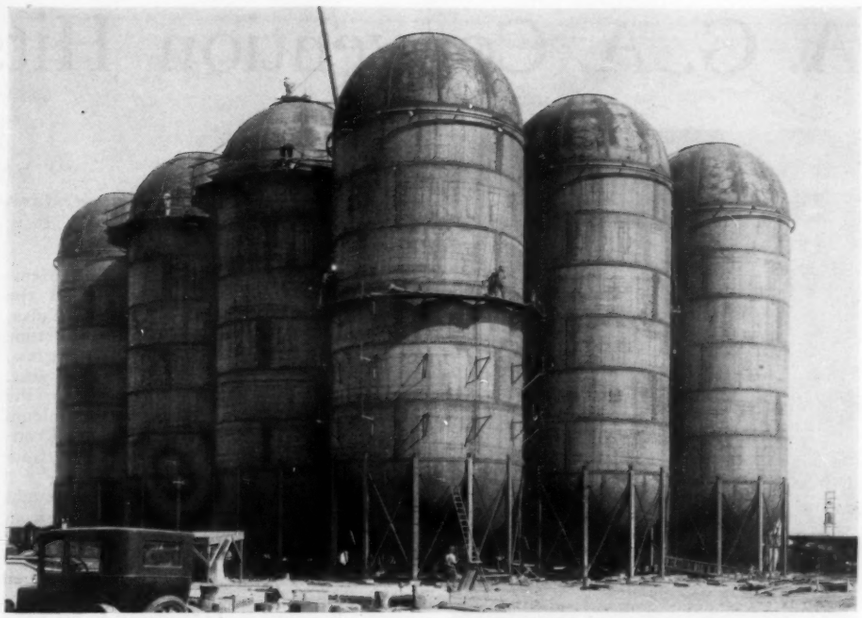
(*Continued from Page 35*)

or the combination rate, according to his preference and service conditions.

The company is also trying out a House-Heating Budget Plan where-under an estimate is made of the customer's heating requirements for the entire year and he contracts to pay one-twelfth of this estimated amount during each month of the contract year. The company reads the meter and calculates the bills on the basis of a standard filed schedule but bills the customer for one-twelfth of the estimated yearly requirements. At the end of the 12 months' period an adjustment is made and either a refund given to the customer if he has overpaid his actual usage, or he is billed for the difference if he has used more than the original estimate. This plan is designed to get away from high bills during the cold winter months and iron out the customer's heating cost. It has not been in effect long enough to enable the company to make any report yet as to its success or failure.

P. G. AND E. AUTHORIZED TO TAKE OVER FOWLER SYSTEM

Pacific Gas and Electric Co., San Francisco, Calif., has been authorized by the State Railroad Commission to acquire the properties of the Fowler Gas Co., Fresno. The company has already been authorized to acquire all Fowler Gas Co. outstanding capital stock, and will now assume all obligations of the company, and will pay in addition $12,500.



An 11-Unit High Pressure Holder Installation

ELEVEN high pressure holder units, of the vertical hemispherical type, have just been completed by the Southern Counties Gas Company at Santa Monica, Calif. The holders have a combined capacity of 2,000,000 cubic feet, with 50-pound maximum to 5-pound minimum pressure. Each of the units is 90 feet high and 32 feet in diameter. Regulating and controlling devices are now being installed, preparatory to putting the holders into service for the winter peaks.

SOUTHERN CALIF. GAS CO.'S LINE OVER THE RIDGE COMPLETED

As *Western Gas* goes to press, word is received that the Southern California Gas Company's line from San Joaquin Valley fields to Los Angeles is almost ready to be placed in service, with November 1 announced as the completion date. The line is 70 miles in length and is constructed of 16- and 22-inch pipe. It is the longest unit in the company's present pipe line program, which in all is calling for expenditure of about $6,000,000. The 40-mile section over the Tehachapi Mountains represented very hard going, the route of the line taking it through some of California's roughest terrain.

The unit of the new carrier extending from Newhall to the West Los Angeles terminal was completed and placed in service on October 16. This section is approximately 22 miles long and is constructed of 26- and 22-inch pipe.

The line will bring approximately 42,000,000 cubic feet of gas daily to the Los Angeles basin cities.

DEATH TAKES E. S. COLE OF SOUTHERN CALIF. GAS CO.

E. S. Cole, division superintendent for the Southern California Gas Co. at Ventura, Calif., died in Los Angeles on October 22 at the age of 58.

Prior to his association with the Southern California Gas Co., Mr. Cole was employed by the Standard Oil Co. of California. His first work with the gas company was at Taft, Calif., where he took charge of production and pipe line maintenance about 1915. In 1925 he moved to Ventura as division superintendent for the company, continuing his duties there until his death.

SAN DIEGO CONSOLIDATED BUYS OCEANSIDE PLANT AND SYSTEM

Purchase of the South Coast Gas Company plant and distribution system at Oceanside Calif., by the San Diego Consolidated Gas and Electric Co. from the American States Public Service Company, was recently announced by Wm. F. Raber, vice-president and general manager of the San Diego company.

The Oceanside system now serves approximately 450 gas customers in the towns of Oceanside and Carlsbad. Eventually the company plans to serve these communities with gas manufactured at San Diego, utilizing the Oceanside plant in a stand-by capacity. Enroute to Oceanside the line will serve the rapidly growing communities of Del Mar, Solana Beach, Cardiff, Encinitas and intervening territory. The district to be served is widely known for its success in the growing of bulbs and avocados and has a population of over 3,000.

BUTANE FOR PALMDALE AND LANCASTER, CALIF.

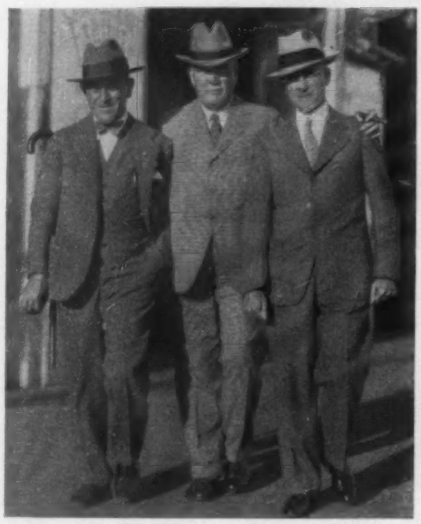
A distribution system for butane service is under way in Palmdale, Calif., for the Southern California Gas Co., with service to begin by the middle of November.

Butane service was also to be started by the company from its newly completed plant in Lancaster, late in October.

COAST COUNTIES PLANS TO SERVE STRAIGHT NATURAL IN DANVILLE

Coast Counties Gas and Electric Co., of Santa Cruz, Calif., is conducting a survey, looking toward the taking of straight natural gas to Danville and the Mt. Diablo Country Club District. James Furth and W. H. Millikin are doing the survey work in this district.

A. G. A. Convention Hits New High



President-elect Clifford E. Paige (Left); 1930 President, B. J. Mullaney (center); and Managing Director Alexander Forward—snapped on a boardwalk promenade.

By CRAIG ESPY

Eastern Manager, Western Gas

IN every department the 12th Annual Convention of the American Gas Association reflected the important year which has elapsed since the national organization last assembled.

Attendance registration at Atlantic City during convention dates—October 13-17—rose to a total of nearly 6,500 passing last year's registration of 5,336 by a margin of more than 1,000.

Exhibition Hall housed 260 individual exhibits of gas appliances and equipment, many of the displays covering a number of booths. The Exhibition, as well as convention attendance, thus represented a high mark in A.G.A. annals. Everything new to the industry was on view, making this large feature of the Convention one of first importance to delegates.

Among the national problems to which the industry gave recognition at Atlantic City was that of natural gas conservation. Convention resolutions reaffirmed the importance of conservation, welcomed the cooperation of all agencies working toward this end, and pledged the industry's support to the plan developed by the Main Technical and Research Committee of the Natural Gas Department with the active support and assistance of the Bureau of Mines.

Convention resolutions also stressed the significance of the Association's Five-Year Program, now nearing its close, and called for the working out by the executive board of another formal plan of organized activity, for a definite period of years into the future.

A national survey of sales cooperation between gas utilities and merchants and craftsmen was also recommended, and the general policy of sales cooperation with other sales agencies strongly affirmed.

After considering invitations from several other cities the A.G.A. selection of 1931 Convention site again went to Atlantic City, the opening date to be October 12.

Another meeting date of prime importance to the industry, as set at the Atlantic City Convention, is that of the Natural Gas Department convention—in May, 1931, at Memphis, Tenn. The 1932 convention of the Natural Gas Department will be in Tulsa, Okla., immediately preceding the International Petroleum Exposition and Congress, which will be held in May of that year. No exhibit of appliances is planned for the Memphis convention, though the Petroleum Exposition may add an independently conducted gas appliance exhibit to its attractions at Tulsa in 1932.

General sessions at Atlantic City brought inspiration in an unusual measure from many of the industry's leaders. More than one speaker called attention to the industry's unabated expansion in the present period when general industry has curtailed its program. President B. J. Mullaney in his valedictory address pointed to the favored position enjoyed by the gas business, in contrast to many other industries. He described the spectacular growth in natural gas service as the "most important business development of the past three years in all American industry." Henry L. Doherty stamped the present era, when manufactured gas companies are in more and more cases turning to natural gas service, as one of general opportunity to those working in the gas industry, saying that times of change are invariably times of opportunity for those who are alert. Samuel Insull also commented upon the virility of the gas industry, complimenting gas men upon their ability to weather the changes to which the industry falls heir, and particularly naming the present broad basis of rate making as a factor for progress. He urged that gas men maintain a forward viewpoint as their constant attitude.

Sounding the same note of optimism, Managing Director Alexander Forward in his annual report announced that the industry's income from operations in 1929 registered an increase of more than $12,000,000, or nearly 9 per cent above 1928.

George B. Cortelyou, senior past-president of the Association, as chairman of the recently formed advisory body on public relations, made up of the Association's past-presidents, brought to the Convention an outline of the new group's proposed function in harmonizing and coordinating the various public relations activities carried on within the Association.

As director of the U. S. Bureau of Mines, Scott Turner brought the Convention assurance of that organization's constant desire to extend cooperation on projects within its field, of which the present contemplated program on natural gas conservation is an outstanding example.

The Association's Laboratory program, expanding with the changes recorded by the industry, was reviewed for the Convention by Nils T. Sellman of the Consolidated Gas Co. of New York.

The ever-important topic of sales promotion had place on the general session program in William H. Hodge's paper on "Competition and New Markets," and in the address of Clifford E. Paige, president-elect of the American Gas Association, on "Sales Allies."

Convention elections ratified the announced nominations, and Clifford E. Paige, vice-president of the Brooklyn Union Gas Co., Brooklyn, N. Y., was inducted into the presidency at Atlantic City. Vice-presidents are R. W. Gallagher of the East Ohio Gas Co., Cleveland; Arthur Hewitt, Consumers Gas Co., Toronto; and N. C. McGowen, United Gas Corp., Houston. The A.G.A. 1931 leadership was reported in full in *Western Gas* for August, 1930.

Natural Gas Department elections installed H. C. Cooper, chief engineer of the Hope Natural Gas Co., Pittsburgh, as chairman, with H. L. Montgomery, manager, Cities Service Gas Co., Bartlesville, as vice-chairman. Four directors were re-elected for two-year terms—J. R. Munce, F. L. Chase, T. R. Weymouth, and T. V. Gregory.

H. L. Dickerson of the United Gas Corp., Houston, and Edgar G. Hill, Southern Natural Gas Corp., were newly elected directors for two-year terms. B. C. Adams was elected to the directorate for a one-year term.

H. C. Cooper

Keen interest and large attendance were noticeable at every natural gas session of the Convention, 600 or more being present at every meeting. The chief report before the natural gas men was that of the Technical and Research Committee. It covered a program of work for the next few years, which includes the investigation into wastage in production, transportation and distribution of natural gas and the development of methods of reducing and eliminating these losses. In this program the Bureau of Mines is providing important assistance. Possible formation of several additional committees to function under the Natural Gas Department is contemplated, according to E. J. Stephany, secretary of the Department.

H. C. Morris, chairman of the Department during the past year, in his opening remarks at the natural gas sessions, gave a penetrating commentary upon the course of natural gas in the past 12 months, and the enhanced program of the Department. Increase of 20 per cent in natural gas sales, and extension to new territories came in for review. Mr. Morris stated that there were 80,000 miles of natural gas transmission main in this country at the beginning of 1930, with some 12,000 additional miles of line either started or projected thus far in the present year. Natural gas, with the completion of projects now maturing, will be distributed in 38 states, eight of these and the District of Columbia having entered the natural gas service area in 1930. Twenty-five states now produce natural gas in commercial quantities.

A central thought in Mr. Morris' message was his word of caution to those responsible for natural gas pipe line enterprises—that they calculate market potentialities in the light of present experience in natural gas projects.

Able Program Awaits So.-West Sales Conference

SALES plans that have made good, and papers of special value to gas company sales managers and individual salesmen will be presented at the First Annual Southwest Natural Gas Sales Conference, to be held in Dallas at the Adolphus Hotel, November 13 and 14, E. J. Stephaney, secretary of the American Gas Association Natural Gas Department, has announced. The sales conference is sponsored by the Commercial Section of the American Gas Association. It is the second held for the benefit of natural gas men, the first being in the Pennsylvania district in February, 1930.

The Dallas meeting will embrace the natural gas interests of Texas, Louisiana, Oklahoma, Missouri, Mississippi, Arkansas, Kansas, and New Mexico.

Among the papers to be presented at the sales conference are the following:

"The Executives' Viewpoint toward Sales Departments."

"Accounting Methods in Merchandising and Promotional Activities."

"Class Rates for Promoting Campaign Sales."

"Selling House Heating in the Southwest."

"Methods of Securing Industrial Business."

"Methods of Compensating Salesmen (in smaller towns: in larger towns)."

"Gas Industry versus Electric Merchandising."

"Home Service as a Sales Aid."

"Sales Campaigns."

"Training Salesmen for Load Building."

"Organizing for Effective Appliance Installation and Servicing."

"Employee Cooperation and Sales Organization for a Group of Small Properties."

"Methods and Results of Trade and Dealer Cooperation."

Ample time for discussion of each topic brought before the meeting has been provided on the program.

The sales council in charge of the conference is made up of the following:

Chester L. May, chairman, Community Natural Gas Company, Dallas.

J. B. Allison, Kansas Pipe Line and Gas Co., Salina, Kan.

S. M. Apperson, Austin Gas Co., Austin.

E. N. Avegno, New Orleans Public Service, Inc., New Orleans.

H. P. Carroll, Houston Gas and Fuel Co., Houston.

O. R. Dungan, Cities Service Gas Co., Bartlesville.

E. J. Hatzenbuehler, Lone Star Gas Co., Dallas.

S. A. Lipscomb, Arkansas Natural Gas Corp., Little Rock.

N. A. Newton, Oklahoma Natural Gas Corp., Tulsa.

Elliott G. Peabody, Baton Rouge Electric Co., Baton Rouge.

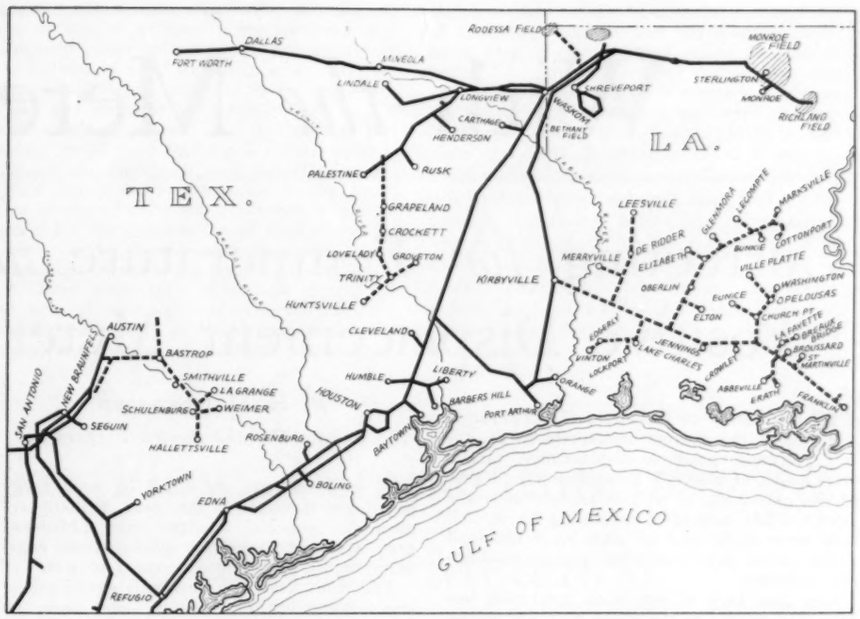
R. E. Sivley, San Antonio Public Service Co., San Antonio.

P. C. Tucker, Arkansas Power & Light Company, Pine Bluff.

C. B. Wilson, Southern Cities Distributing Co., Shreveport.

MERCED TO BE SERVED "NATURAL" BY SAN JOAQUIN LT. AND POWER

San Joaquin Light and Power Corp., of Fresno, Calif., plans to take natural gas service to Merced, according to an announcement by A. Emory Wishon, president of the company .



Portions of United Gas transmission system are shown above, the broken lines charting in the $6,250,000 Louisiana extension just announced by the company.

$20,000,000 Expansion *for* United

UNITED Gas Corp. has under way an expansion program which calls for expenditures totaling approximately $20,000,000, of which about $8,500,000 will be spent on improvements to the existing system, the balance to go into new construction.

Probably the most important item on the program is the construction of a 16-inch pipe line from Kirbyville, Texas, to serve 42 communities in Louisiana at an estimated expenditure of $6,250,000.

Final surveys are now being made of the proposed route and uniform franchises have been acted upon favorably by 40 of the 42 communities it is proposed to serve in the new project. The others, Lake Charles and Lafayette, have manufactured gas plants and will be served at their respective city gates.

The proposed line will tie into the Magnolia Gas Company's 16-inch carrier line at Kirbyville, Texas, and extend eastward to Franklin, La.

Leesville, Merryville, De Quincy, Vinton, Elizabeth, Lecompte, Marksville, Ville Platte, Abbeville, Eunice, Breaux Bridge, Broussard, and St. Martinsville will be the termini of the lateral lines which will branch out from the main line at a dozen points. The laterals in the proposed route take in the parishes of Newton, Vernon, Beauregard, Calcasieu, Allen, Jefferson Davis, Rapides, Avoyelles, Acadia, Evangeline, St. Landry, Lafayette, St. Martin, Vermillion, Iberia and St. Mary.

Preliminary plans call for 16-inch pipe from Kirbyville to a point near Fenton in Jefferson Davis parish. From that point smaller pipe will be used, as decided after completion of the extensive survey.

In addition to this project, the company has under way, through various subsidiaries, the construction of several additions to existing lines, totaling about 350 miles. One of the major items is the 100-mile 6-inch line being laid in Anderson County to serve Huntsville, Crockett, Grapeland, Elkhart, Groveton, Lovelady, Trinity, and others. Franchises already have been secured in those towns.

A 40-mile, 16-inch line was recently completed from Refugio to Pettus, connecting with the Houston Gulf Gas Co. system. Houston Gulf Gas Co. is looping its Refugio to Houston line and has completed the link between Refugio and Edna, a distance of approximately 60 miles. Eighty miles of line will be required to complete the loop, which is being constructed of 16-inch pipe. This addition will carry gas to augment the service of the Houston Gas and Fuel Co., in Houston.

Three new compressor stations are being erected by the company which will add about 8,530 h.p. The Goodrich station on the Dixie Gulf Gas Co. line will have a total of 3,000 h. p. The Sterlington, La., station is adding a 4,000 unit, and a 1,530 h.p. station at Bruni is nearly complete. Houston Gulf Gas Co. is also replacing equipment in its Edna station on the Refugio-Houston line.

NEW ORLEANS INC. NOW USING ODORANT IN NATURAL GAS

The gas department of New Orleans Public Service Inc. started the odorization of their natural gas September 25. An oil known as Calodorant No. 3, which is manufactured by the Standard Oil Company of California, is being used to impart a sulfurous odor to the gas. Only 3½ gallons of oil per million cubic feet of gas is required.

The oil is injected into the gas mains by means of automatic control so that as the gas flow changes the oil flow changes proportionately. The gas going to the low pressure system, which supplies domestic and commercial consumers, is the only gas being odorized at present. The high pressure gas will probably be odorized from time to time to detect any leaks in the welded steel mains.

With *the* Metermen

Correcting *for* Temperature *in* Large Volume Positive Displacement Meter Measurement

By H. M. CRAWFORD

*Los Angeles Gas and Electric Corporation**

THIS study of the effect of temperature upon the correct measurement of gas through positive displacement meters was made to actually determine the degree of this correction as well as to determine the most feasible method of correcting for it. All tests were made and all data were obtained under actual field conditions and on consumers' premises.

The past lack of any such correction has been due mainly to the claim that any excess temperature during the warmer months was compensated for by the lower temperatures during the winter months. It was further maintained that the majority of the gas was sold during these cooler months. Under this condition it may be true that varying temperatures may have balanced when taken over the period of a whole year, particularly when only domestic meters are considered.

The advent of natural gas in the place of manufactured gas, however, has introduced new uses for gas, required in such large quantities throughout the year without regard for seasonal changes that additional care must be taken by measurement engineers in the actual measurement of gas.

This comparatively new and ever-increasing demand for natural gas comes from the industrial users of power. Gas is purchased by this type of consumer in volumes amounting to thousands of cubic feet per hour, and for this reason alone every factor affecting measurement must be carefully applied.

Gas measurement through positive displacement meters is registered in cubic feet, regardless of the temperature or the pressure while passing through. The temperature and pressure may vary under actual working conditions, and it is common practice to reduce to the standard cubic feet to correct for varying operating conditions; as our standard cubic foot is the amount contained in one cubic foot of volume at 60° F., and 14.73 pounds per square inch pressure, gas measured under any condition of temperature or pressure other than the above base must be corrected to that base; when it is understood that a 5°F. change in temperature makes approximately 1 per cent difference in volume, some idea of the seriousness of this problem becomes very apparent.

H. M. Crawford

Gas temperatures approach the temperature of the meter, so that where meters are in exposed locations and in the direct rays of the sun, wide ranges in temperatures result. Furthermore, the rate of flow has a direct bearing upon temperatures. The smaller the flow, the more nearly the gas temperature will approach the meter temperature.

Gas temperatures through exposed sets varied as follows: On one set, a maximum of 115° F. to a minimum of 49° F. during one 24-hour period on a day when the maximum outside temperature was 88° F.—a range of 66° F.; another set varied from 110° F. to 52° F.—a range of 58° F. with a maximum outside temperature of 88° F.; another set varied from 125° F. to 69° F.—a range of 56° F.; with an outside maximum of 95° F.

The results of the test on one of the above meter sets, which is exposed to the direct rays of the sun during the majority of the day, show a range of 56° F. for a maximum outside temperature of 95° F. The average gas temperature while gas was passing through the meter was 118° F., while the average was 90° when taken over the 24-hour period. If the average gas temperature is taken as 118° F., there should be a correction made on the volume of gas passed, for which the consumer is charged, of approximately 11 per cent.

On sets where the meters are inside buildings, the temperatures do not vary over such wide ranges, the maximum variation being 16° F. on one and 14° F. on another. The maximum temperature did not exceed 86° F. for an outside maximum of 96° F.

The first test was on an industrial consumer served by two 500-B Metric Meters. This set was exposed to the direct rays of the sun throughout the morning. All service piping, valves, regulators, and meters were

*Presented before the Southern California Meter Association, September 25, 1930.

Positive Displacement Meters Head October Program

RETURNING to the Los Angeles Gas and Electric Corp. building in Los Angeles for its October meeting, the Southern California Meter Association met on October 23 with 80 members present. Following dinner in the banquet room, the meeting adjourned to the L. A. G. and E. auditorium for a business program.

Large volume measurement by positive meters was the topic of the evening, dealt with in two papers, given by F. H. Winslow of the Southern Counties Gas Co., and M. J. Cereghino of the Los Angeles Gas and Electric Corp.

Both papers presented comparative advantages on use of orifice type and positive displacement type meters in various applications. Reference was had to the report of the Pacific Coast Gas Association's 1929 committee on "Economic Factors Governing the Selection of Types of Meters," and cost data were presented on installation, and upkeep charges using both types. The meeting was thrown open to general discussion, following the papers.

Reporting for the Gadget Committee, Earl D. Nettles announced winners in the recently closed gadget contest, as follows:

H. S. Elayer received first prize of $10 given by the S.C.M.A. for his gadget entry—a calibration starter.

Two additional awards of equal merit were conferred upon L. Jakowsky and Gordon Buchanan, a copy of the Natural Gas Handbook by Diehl being given Mr. Jakowsky by Westcott & Greis, Inc., and the Engineers Handbook of the Foxboro Co. to Mr. Buchanan by the Foxboro Co. The gadgets submitted were a double date stamp for dating orifice meter charts, and an aspirator bulb for calibration of orifice meters, respectively.

Five foursomes were out for the Association's October 19 golf tournament, which was won by F. W. Thompson of the Pacific Pipe and Supply Co. With the addition of another name to the S.C.M.A.-*Western Gas* Good Fellowship Trophy in the next tourney, the way will be paved for a play-off tournament to decide upon permanent possession of the cup.

Exhibitors' Night Dated *for* November 19

EXTENSIVE plans are being made for the Southern California Meter Association's Exhibitors' Night, to be held on Thursday, November 19, at the Los Angeles Gas and Electric Corp. auditorium, 810 South Flower Street, Los Angeles.

Last year the organization held its first exhibit of measurement and related equipment, with some 25 manufacturers represented. More than 30 individual exhibits are in prospect for the coming display, according to M. J. Cereghino, who is chairmaning the committee in charge of the exhibit.

The displays will be open from 4 p.m. to 10 p.m., and a large attendance from gas and oil companies in southern California is anticipated.

A short program and entertainment are also being arranged. The program will feature the subject of butane, dealing with its manufacture, transportation, distribution and characteristics.

painted black. Temperatures were taken through a toe fitting at the outlet of the meter, which allowed the thermometer element to be in the direct path of the flowing gas. One thermometer was placed on each meter to note any difference as between meters. The thermometers were set so that they recorded accurately and similarly over their range.

After the first few days one of the meters was painted with aluminum paint. This was done to note any appreciable difference in temperature between a paint which reflects heat and one which will absorb heat. Aluminum paint was used on one meter and its fittings, while the other was left black. The gas which passed through the aluminum painted meter did not become so warm, nor did it cool to the same extent as that which passed through the meter painted black. In this particular case, the range of temperatures was about 13° F., wider in the case of the meter painted black.

The next test, was made on another industrial consumer where the gas was metered through two No. 5 Emco meters. This set was an unprotected one which was exposed to the direct rays of the sun during the majority of the afternoons. In this case an outside temperature of 70° F. resulted in a gas temperature of 90° F., while the highest temperature recorded was 110° F. with an outside maximum of 88° F. This shows that the gas was heated 22° F. above the outside temperature with the set unprotected and painted black. Through cooperation with this consumer the test was completed by his building a house over all exposed piping and the meters themselves. With this protection the highest gas temperature recorded was 98° F., with an outside maximum of 93° F. This shows an increase of 5° F. over the outside temperature, and results in a decrease of 12° F. in gas temperature. The meters and set were then painted aluminum. Under these conditions the maximum gas temperature was 90° F. for an outside maximum of 95° F. Here the gas is 5° F. cooler than the outside, and resulted in a saving of 20° F. due to the protection alone. This shows a gas temperature equal to that shown where the set was unprotected, when a 70° F. outside temperature resulted in a 90° F. gas temperature, but with the additional 25° F. rise in outside temperature having no effect on the gas.

Mention was made above that the means used to obtain protection were by the use of aluminum paint and a small house built to cover the meters and all exposed piping and fittings. The house was built by the consumer on whose premises the tests were being made. The house was built of a wallboard material, and it was of a size such as to allow for easy access for maintenance and, if necessary, for the removal of either or both of the meters. The house was partly ventilated by the drilling of small holes around the base of the structure, and an open strip was left around the top.

This type of construction is easily and cheaply erected and is a great aid in the control of the temperature of the gas.

A study of gas temperatures in our distribution mains was made to determine the variations due to ground temperatures. In the case of the Los Angeles Gas and Electric Corporation the gas temperature very rarely is below 55° F., while the mean is 68° F.

The orifice meter department of this corporation corrects for temperature variations in the measurement of gas through orifice meters. In these calculations a variation of 10° F. is necessary to make a correction of 1 per cent in the volume metered. It is true that larger volumes of gas are metered in this manner, and that a temperature correction assumes a more important title in the case of larger volumes. But positive displacement meter measurements are increasing to a volume of such size as to make this correction imperative sooner or later.

The gas industry as a whole will find it much more desirable to inaugurate this change, itself, than to have it forced upon it from outside sources at some future date.

This particular locality, due to the proximity of the oil industry, represents a unique district for the introduction of natural gas as a means in the development of power. Here competition between gas and oil is very keen, and either must take advantage of any of the natural weapons it possesses in the furtherance of uses to which either may be put. Natural gas has inherent advantages, which should be exploited—cleanliness, ease of handling, lack of ash, no storage problems, ease of control; and above all, cheapness. The margin between the price of gas and oil is so narrow that a correction such as the temperature correction may turn the tide in favor of gas. It is human nature to buy more of a class of merchandise if it may be purchased cheaper in larger quantities, and it is in these larger volumes, only, that a temperature correction is feasible or practical. The sale of natural gas to more large consumers in larger volumes will result in greatly increased sales during the warm months, and will allow for more economic gas purchase contracts by the gas companies themselves.

Gas Flow Temperature *through* Orifice Meters

By Maris Levering
*Southern California Gas Company**

A STANDARD cubic foot of gas in this locality is considered to be the volume that will fill 1 cubic foot of space at an absolute pressure of 14.73 pounds per square inch, and at a temperature of 60° F.

Gas which is measured by orifice meters seldom passes through them under standard conditions, and therefore it is usually necessary to make the temperature and pressure corrections.

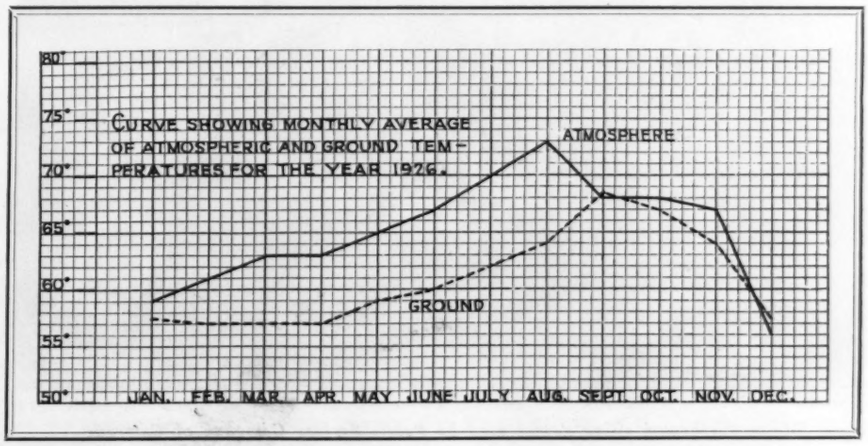
Maris Levering

We wish, at this time, to call attention to the temperature condition of gas as it actually passes through the meter. There are times when the temperature is effected by other than atmospheric conditions, particularly at meters that are at the discharge of compressor stations. As the temperature here will vary somewhat with the volume of gas that is being compressed, the only sure method of determining the flow temperature is to install a recording thermometer in the meter, and be governed according to the chart received from it.

If the temperature of the gas is not affected by conditions other than atmospheric, the general practice is to have a recording thermometer at one or two principal meters, and use the record obtained as the standard flowing temperature of the gas for the vicinity. This, however, cannot be accepted as satisfactory, for the temperature of some meters may differ considerably, depending upon whether the line runs above ground, and in the sun for some distance before the gas is measured, and also upon the velocity of the gas through the meter.

The Los Angeles Gas and Electric Corp. kept the bulb of a recording thermometer buried at a depth of 3 feet for a period of more than a year, and thereby obtained a record of the ground temperature at this

*Presented before the Southern California Meter Association, October 23, 1930.



depth. This material was used in a report of the Unaccounted-for Gas Committee of the Pacific Coast Gas Association, and data for the accompanying curve was taken from that report.

The curves show the monthly average atmospheric and ground temperatures for the year 1926. The solid line shows the atmospheric, data for which was secured from the United States Weather Bureau at Los Angeles, while the broken line shows the ground temperature plotted from the records of the thermometer referred to before.

Now, the temperature of the gas as it passes through the meter, if it comes from a buried line and in a sufficient quantity, is somewhere between atmospheric and ground. If the meter is passing a large volume of gas, the tendency is for the gas to conform more nearly to the ground temperature, while the gas which is being measured in smaller quantities, and passing through the long orifice meter tubes at a low velocity, has a tendency to conform to the atmospheric temperature; or if the tubes are in the direct rays of the sun, the gas may rise to a temperature higher than atmospheric.

It may be seen from the curve that there is a lag in the ground temperature. The ground temperature curve follows the curve of the atmospheric temperature, but is always a period of time behind it.

On meters measuring very large volumes of gas, it is of course desirable to change the coefficient weekly, or at least monthly, but on meters passing in the neighborhood of 50,000 to 100,000 cubic feet per day, it would seem that a coefficient change for temperature four times a year is sufficient. The change need not necessarily occur every three months, as the spring and fall temperatures are not of as long duration as the summer and winter.

I believe there is room for study on this subject, especially on the relationship between ground and atmospheric temperatures, as it would simplify matters a great deal if, by knowing the atmospheric temperature alone, we could accurately determine the flow temperature of gas through orifice meters.

Merry-Go-Round *for* Old Gas Meters

IT HAS been said that the methods applied to gas meters are like those used with school children, that periodically a vacation period must be allowed so they may get a rest and refresh themselves for further work. Public Service Company of Colorado carries this simile one step farther and supplies a merry-go-round for the meter's vacation.

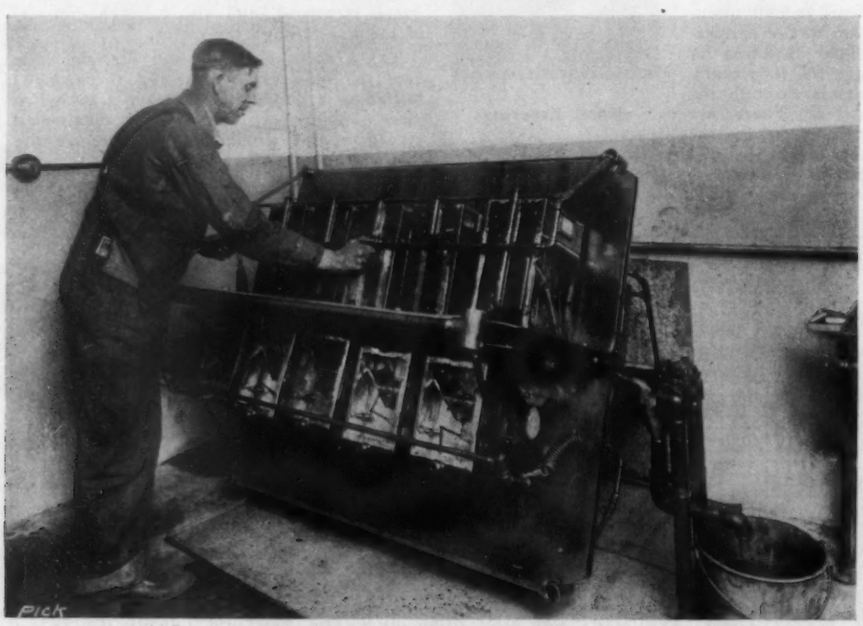
For many years, the customary method of oiling diaphragms had been used, where measured quantities of diaphragm oil were introduced into each diaphragm through the inner port of the valve, the meter placed on its side in a V-shaped trough and frequently turned, each time one quarter of a revolution, always keeping the front and back of the meter facing the ends of the trough. This plan had the advantage of minimum equipment requirement, but had several disadvantages, among which were the uneven application of oil—heavy at four points, light elsewhere—and the possible failure to turn the meters through all positions.

A. H. Tilton, foreman of the regulator division of the gas meter repair department, devised and built the merry-go-round which has greatly improved the diaphagm oiling process. As shown in the photograph, the oiling machine consists of four partitions 90° apart, along a shaft mounted at either end on bearing blocks. By means of two washing machine reduction gears mounted in tandem, the speed of the ¼-horsepower motor operating the device is reduced to about three revolutions per minute. The sections between partitions hold six 5-light meters each, allowing a total of 24 meters to be oiled at one time. Larger meters, up to 30-light size, can be handled by this machine.

Meters to be oiled have the top, back plate and valve cover removed, and about one gill of diaphragm oil poured into each diaphragm. The oiling machine is then loaded evenly so that it will be in balance. Pipe frames hinged to the ends of each partition hold the meters in position under spring tension and prevent them from dropping out of the machine as it operates.

The usual oiling time is 25 minutes, which turns the meter over about 75 times, equivalent to 75 applications of oil to all of the inner surface of the diaphragm. While the amount of oil put into the diaphragm is not large enough to completely fill the pocket, the slow rotation of the meter allows the oil to spread over the entire inner surface of the diaphragm leather. Experience has shown that with most diaphragms, the oil has penetrated to the outer surface by the end of the oiling time and that almost none is left unabsorbed.

This machine has made possible a much more thorough application of oil with about one-half the quantity, gives a much more uniform result, and, in the Public Service Company of Colorado meter shop, has made it possible to oil nearly four times the number of meters previously handled with less labor than was required by the old system.



Meter diaphragm oiling device used by Public Service Company of Colorado

An Auxiliary Scale *for* Water Manometers

Submitted by

GEO. H. BRIGGS

HERE is an auxiliary scale, fitted with a clamp for adjustable attachment to a water manometer, by the use of which only one end of the column need be read.

It may be merely a scale graduated in half-inches divided into tenths, such as can be purchased at any store handling draftsmen's supplies. Or it may be a home-made scale such as the one designed by Mr. Briggs, and shown in diagram with this description. It is made of 1/16-inch brass, 1 inch wide and 12 inches long, marked by hacksaw cuts filled with black enamel.

The clamp must be designed with reference to the column to which it must attach. It may be merely a spring clip.

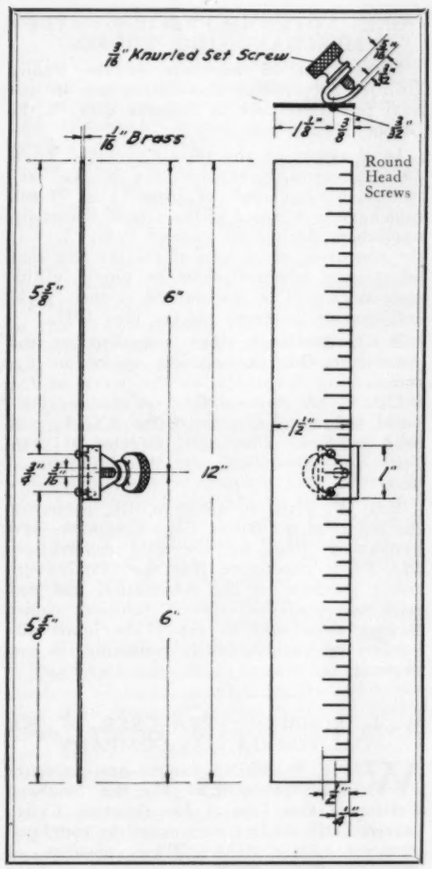
Directions for Adjusting

Apply a differential to the manometer and note the sum of the two readings with care. Locate the auxiliary scale adjacent either end of the water column so that the water maniscus indicates this sum on the auxiliary scale. (*Note*: If the glass tubing of the manometer is of substantially uniform cross-section, and the auxiliary scale not over one foot long, the error due to tubing diameter will be undetectable. As long as the quantity of water remains unchanged, the scale will not need to be reset.)

This one end of the water column will unfailingly indicate amounts that equal the sum of the two ordinary readings.

Directions for a Specific Use

When "running a column" on a meter, start with a full-scale differential on the



Graduations in scale shown on diagram above are in quarters and halves of inches, made with saw cuts.

meter and, by barely cracking the by-pass valve, allow the column to coast down *very slowly*. As the water maniscus comes in line with desired readings, thump the meter so as to cause the red pen to make a slight "nick" in the line.

Then reverse the process, beginning at zero with the high-pressure valve barely cracked so as to cause the column to climb at the same rate at which it previously descended, and thump the meter as before.

This gives double nicks in the line. The distance between these represents twice the friction lag of the meter, which is valuable information. The mid-point between nicks represents exactly the differentials at which it was desired to check the meter; and the whole set of double nicks is an easily interpreted indication of the nature of adjustment needed.

According to the originator of this "gadget," this method of "running a column" is highly satisfactory, due to its rapidity and accuracy, and the preciseness of the record obtained. It has been in use for nearly two years. A big advantage in its use, says Mr. Briggs, is that "one only needs to 'stand on his head' once, to read the lower end of the column. The saving in hats will pay for the gadget."

This auxiliary scale earned an honorable mention in the first S. C. M. A. "gadget" contest.

SKELLY OIL CO. GRANTED GAS FRANCHISE AT WAUKON, IOWA

Skelly Oil Co., of El Dorado, Kan., has been granted a franchise for the service of gas in Waukon, Iowa.

New Commercial Heating Rate

NEW heating schedules for commercial buildings which are expected to represent an approximate saving of 50 per cent to users of large quantities of gas have just been put in effect by the Pacific Gas and Electric Co., San Francisco, throughout practically the entire territory served.

Schedule G-1-H-N may be taken as an example of the basis on which these rates have been issued. This is the schedule for San Francisco and Oakland and immediate vicinity. Similar schedules with slightly higher commodity charges, are in effect throughout other portions of the system.

Rates:

Service Charge: Based on aggregate hourly burner capacity as follows, per year:

First	400,000 B.t.u. or less	$84.00
Next	1,000,000 B.t.u. per 100,000 B.t.u.	7.00
Next	2,000,000 B.t.u. per 100,000 B.t.u.	3.50
Excess	over 3,400,000 B.t.u. per 100,000 B.t.u.	1.40

Commodity Charge (to be added to Service Charge):

		Per 100 cu. ft.
First	50,000 cu. ft. used per month	3c
Next	200,000 cu. ft. used per month	2.5c
All excess over	250,000 cu. ft. per month	2c

Minimum Monthly Charge: The Service Charge.

This schedule is available only on annual contract. The service charge is payable in seven equal monthly installments with bills based on regular meter readings in the months of October to April, inclusive.

This schedule is applicable only to installations where the aggregate hourly burner capacity of gas fired building heating equipment is at least 200,000 B.t.u. per hour. It is not applicable to single family residences or to separately metered flats or apartments, or to any service where gas is used for the preparation of meals. Any residence having gas heating equipment of 1,000,000 B.t.u. per hour or more of gas burner capacity may receive service for such equipment on this schedule.

The burner capacity to be used in applying this schedule is the aggregate capacity, determined to the nearest even 100,000 B.t.u. per hour, of all burners which may be turned on at the same time, based on the name plate rating of all devices having a name plate rating approved by the testing laboratories of the American Gas Association, and as to other devices, the standard rating as determined by the testing laboratories of the American Gas Association or by the company. In the case of appliances designed for other fuel and converted to gas, burner capacity, for the purpose of this schedule, will be 85 per cent of actual capacity as determined by test.

The above commodity rates are subject to increase or decrease on the basis of 1 mill per 100 cubic feet for each 6c per barrel increase, respectively, in the market price of fuel oil, as regularly quoted by the Standard Oil Company of California, from 89c per bbl. f.o.b. Richmond, change to be to the nearest one-hundredth cent, and to become effective on all regular meter readings taken on and after the 30th day following such change in the price of oil; provided, however, that in no event will the commodity rates be reduced more than .15c below those shown above.

Heretofore on all commercial heating installations, the ordinary block rate prevailed. The company feels that with the new rate, a very appreciable increase in the commercial heating load will be enjoyed.

Decision on Political Activities

AN IMPORTANT decision handed down recently by the Railroad Commission of California followed that body's investigation into activities of Southern California utility companies in connection with a municipal election which involved phases of the municipal ownership issue. The investigation concerned expenditures of the utilities for political purposes and the diversion of employees' time from regular duties. In dismissing the investigation the commission gave as its findings that the expenditures of the companies were in every case charged to surplus accounts and not to operating expenses, and that there was no impairment to service because of the employee time devoted to the election activity.

In a concurring opinion Commissioner Decoto had the following to say:

"The control of the corporate acts of any corporation including public utilities is placed directly in the hands of the board of directors of such corporation, and . . . it is their duty to promote the interest of the stockholders and the corporation. . . . It is also the duty of the board of directors of any corporation, including a public utility corporation, to conserve the assets of the corporation, to take whatever steps are useful to protect the business of the corporation as a whole, to prevent if possible the severance of its property and the unwise taking thereof by a municipality and to expend the funds of the corporation for the benefit of the stockholders. . . . This commission cannot usurp the duties of the board of directors of any public utility . . . "

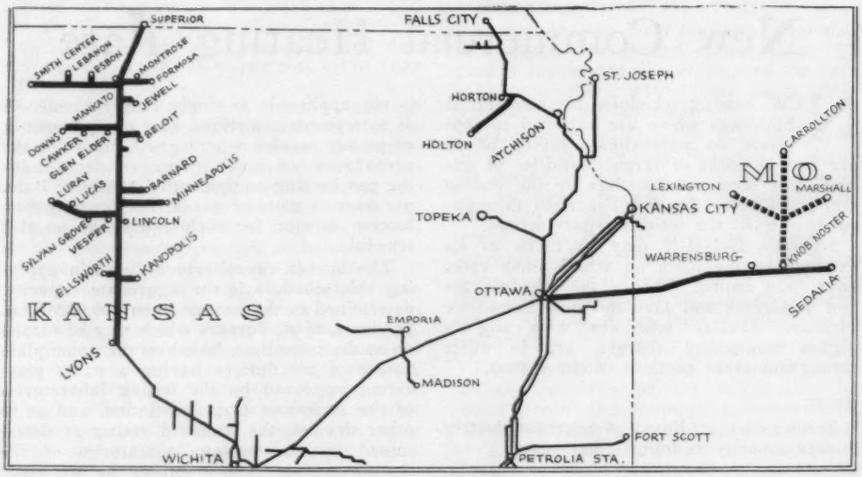
The California Commission in this decision evidently records its opinion that a utility is justified in taking steps against the attacks of municipal ownership advocates.

PAPICO ORIFICE METER DATA IN CATALOG FORM

Pacific Pipe & Supply Co. has just issued its Catalog H, entitled "Papico Orifice Meter Data." The contents cover flow tubes; straightening vanes; general formulae for use in installation of straightening vanes; orifice discs, and Perfection Duplex Traps, and are assembled in a special cover in looseleaf form. Copies may be had by addressing the company at 1002 Santa Fe Avenue, Los Angeles, Calif.

DUNHAM SCOTT NOW MANAGER OF FORT SMITH GAS CO.

Dunham Scott is now serving as manager of the Fort Smith Gas Co., Fort Smith, Ark., having been appointed to this post following the resignation of A. Graham Williams, Jr., who plans to enter private business.



Heavy lines show three recently completed Cities Service gas carriers, the Lyons-to-Superior, Horton-to-Holton, and Ottawa-to-Sedalia extensions. Broken lines indicate newly launched project.

Cities Service Gas Adds *to* System

CITIES Service Gas Co. of Kansas City, Mo., has within the past two months added approximately 350 miles of transmission line to its systems in Kansas and Missouri.

The Lyons, Kan., to Superior, Neb., carrier added 20 towns and approximately 250 miles, including lateral lines to Smith Center, Formosa, Downs, Jewell, Beloit, Luray, Minneapolis, Barnard, Ellsworth and Kanopolis. Lincoln and Mankato are served from the main line, and Lebanon, Esbon, Montrose, Cawker, Glen Elder, Lucas, Sylvan Grove, and Vesper, from the various laterals. New offices have been opened by Gas Service Co., in practically all of the towns. This extension was begun in June and completed in September. H. S. Hicks is manager of all new properties in the Kansas section.

The Union Public Service Co., Cities Service subsidiary, is operating the district offices on this line and has filed a schedule of rates for towns on the Lyons-Superior line, which has been approved by the Kansas Public Service Commission.

The Superior, Neb., office of the Nebraska Distributing Co., also a Cities Service subsidiary, is under the direction of R. O. Pitman, formerly of the Kansas City Gas Co., Kansas City, Kan.

The Ottawa station in Kansas is the point of origin for another important development by the company, the 12-inch transmission line extending 108 miles to Sedalia, Mo. Construction was begun about the middle of July, and completion was announced on October 15.

Plans were practically complete on October 15 for turning gas into the Sedalia distribution system, owned by Federal Light and Traction Co., Cities Service subsidiary. The distribution system at Warrensburg is also practically complete, and service was expected to start by the first of November.

The company has awarded a contract for the construction of a major extension from Knob Noster, north to Carrollton and Waverly. This line will be 8-inch, and will pass approximately 9 miles east of Higginsville. It will cross the Missouri River bridge at Waverly, and will extend north to Carrollton. A branch line will originate at a point near Higginsville, extending northwest to serve Lexington. Still another lateral will originate at practically the same point and extend east to Marshall. Both of these extensions will be 6-inch lines. Construction work on the 8-inch extension has already begun, all of the rights of way having been obtained.

Franchising activity in the territory to be served from these extensions has progressed, with the granting of permits in Carrollton, Knob Noster, Higginsville, Richmond, Lexington, Sweet Springs, Marshall and Concordia.

Another extension which Cities Service Gas Company completed recently is the 18-mile line to Holton, originating at a point near Horton on the Atchison-Falls City carrier. An office was recently opened at Holton.

FIVE HIGH PRESSURE HOLDERS FOR SANTA MARIA GAS CO.

According to Allen T. Fesler, general superintendent of the Santa Maria Gas Co., Santa Maria, Calif., the company recently completed a vertical high-pressure gas holder of 154,000 cubic-foot capacity at Paso Robles, and has under way three others of the same type and capacity, two, nearly completed, in the industrial district of Santa Maria, the other to be completed by December 1, at Lompoc.

SO. CALIF. GAS CO. BUILDING 16-INCH CONNECTING LINE

During October the Southern California Gas Co. announced plans for 5 miles of 16-inch line from the company's Ventura compressor plant to join the transmission system at Mills and Telegraph Road, running by way of Hall Canyon. The line is expected to be complete about November 15, according to H. P. George, general superintendent of the company. It will cost in the neighborhood of $100,000, and will facilitate gas deliveries to the Los Angeles' metropolitan area.

JAMES RILEY TO BE CHIEF CLERK AT MONETT, MO.

James Riley has been named chief clerk of the Ozark Distributing Co., Monett, Mo., a Cities Service Gas Co. subsidiary. Artford Hicks will take Mr. Riley's position with the Joplin Gas Co.

GAIN NOTED IN PUBLIC UTILITY MERCHANDISING TOTALS

More than 65 members of the Public Utilities Advertising Association met in annual fall conference at Atlantic City, N. J., October 13.

In a report of the results obtained from 1930 advertising expenditures it was revealed that increases of from 15 to 50 per cent have been noted in the sale of household appliances during the current year. It was the consensus of opinion at the meeting that advertising appropriations of public utility companies will be maintained at their present level or increased for the year 1931.

B. J. Mullaney, then president of the American Gas Association, spoke briefly, commenting favorably on the work of the P.U.A.A. A message from Alexander Forward, managing director of the A.G.A., was read by Keith Clevenger, director of publicity and advertising for the gas association.

Eric W. Swift of Chicago, Ill., presented the report of the Better Copy Committee and announced plans for the 1931 competition. Mr. Swift announced that the 1930 advertising portfolio of the Association had met with unprecedented success, sufficient copies having been sold to repay the loans advanced by various utility companies to underwrite it.

W. E. ROBBINS, TREASURER OF SO. CALIFORNIA GAS COMPANY

W. E. ROBBINS, for the past six years general auditor for the Southern California Gas Co., of Los Angeles, Calif., was recently made treasurer of the company. The position of auditor has been taken by George A. Detrick, who formerly held the post of chief traveling auditor.

W. E. Robbins

Mr. Robbins received his early education in Indiana, going to California 23 years ago. He was employed by Stone & Webster during the development of Big Creek for the Pacific Light & Power Company.

George A. Detrick, who has been advanced to head the auditing department, has been in public utility work for several years, and is widely known throughout the state owing to having traveled for Southern California Gas Co. in the capacity of auditor.

JUAREZ TO HAVE NEW HIGH PRESSURE LINE FROM EL PASO

In preparation for an expected large winter consumption of gas by the Juarez Gas Co., S. A. in Juarez, Chihuahua, Mexico, the Texas Cities Gas Co., of El Paso, which furnishes gas to the Juarez company, is renewing the 2-inch high pressure feed line from El Paso to Juarez across the Rio Grande River over the Stanton Street traffic bridge. The new 2-inch feed line, which will be welded throughout, will connect with a 4-inch high pressure line approximately 2000 feet north of the Rio Grande. This new 2-inch line will replace an old 2-inch screw line which was laid to serve Juarez in 1909. An additional 6-inch low pressure line also serves Juarez across the Mexico Central Railway Company's bridge.

CONSUMERS GAS CO., NEWLY FORMED TO HEADQUARTER AT ARTESIA

The Consumers Gas Company is a recently formed organization, the result of the merger of five gas companies of New Mexico and Oklahoma, according to current dispatches in the press.

The new company will have assets amounting to $7,000,000, having purchased outright the stock of the Pecos Valley Gas Co., of Artesia, N. M., the Gas Company of New Mexico, Clovis, the Lovington Gas Co., Lovington, N. M., the Pioneer Gas Utility Co., of Oklahoma City, Okla., and the Oklahoma General Gas Co. It is reported that none of the five companies will lose its identity, but will operate through the Consumers Gas Co., with general headquarters at Artesia, N. M.

Names of the members of the board of control as reported are as follows: Lee Moor of El Paso, Tex.; T. F. Murchison of Chicago, Ill., and Albert T. Woods of Artesia. Officers of the new company are: Albert T. Woods, president, and Morris Brown of Artesia, secretary. Directors are: Lee Moor of El Paso; T. F. Murchison of Chicago; K. F. McGeehee of Dallas; C. W. Murchison of Chicago and A. T. Woods of Artesia.

A. G. A. TO ESTABLISH TESTING STATION ON PACIFIC COAST

The American Gas Association has announced plans to establish an inspection station of its Testing Laboratory on the Pacific Coast. The new station will be located at Los Angeles, California.

It is pointed out by members of the Laboratory managing committee that freight and express charges on equipment shipped to the Testing Laboratory at Cleveland for approval are more than twice as high for manufacturers on the Pacific Coast as for concerns located in the eastern States. However, as it is not planned to establish an Approval Testing Station on the Pacific Coast, this item will be of consequence only when it is necessary for appliances to be returned for correction. Such additional expense, it is explained, undoubtedly could be avoided, at least in part, were appliances given a careful inspection before they are shipped to the Laboratory at Cleveland.

MONTERREY-SALTILLO EXTENSION TO COST TWO MILLION

It is estimated that the extension of the Roma-Monterrey natural gas transmission line of the Compania Mexicana de Gas S.A., from Monterrey, Mex., to Saltillo, will cost in the neighborhood of $2,000,000, and will serve Torreon, Laredo, and Gomez Palacio en route. These cities are in the greatest cotton raising area of the republic of Mexico, and are also railroad towns. Charcoal burning is their present method of obtaining heat for cooking.

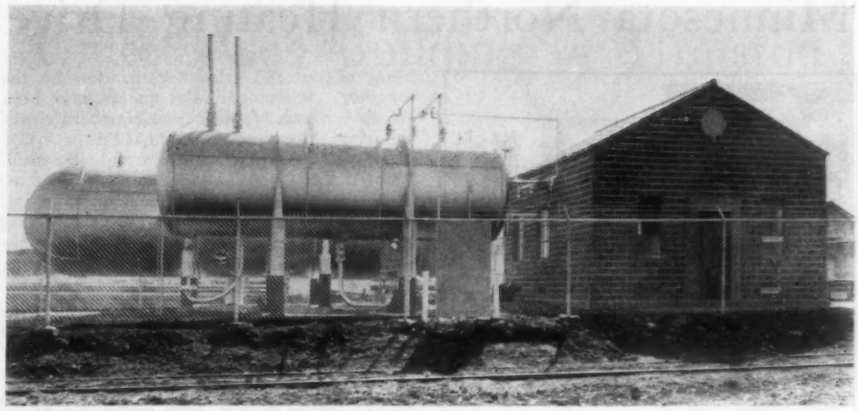
The Compania Mexicana de Gas is a subsidiary of the United Gas Co.

CENTRAL PUBLIC SERVICE CO. MOVES CHICAGO OFFICE

The Chicago office of the Central Public Service Co. has moved to the Railway Exchange Building at Jackson Blvd. and Michigan Avenue, where the company will occupy the two top floors of the building. The new address in 224 S. Michigan Avenue.

ITTNER NEW COMMERCIAL MGR. FOR TEXAS PUBLIC SERVICE

H. D. Ittner has taken over the duties of commercial manager for the Texas Public Service Co., at Austin, Texas. Mr. Ittner comes to his new post from the Birmingham Gas Co., Birmingham, Ala.



Air-butane plant at Vacaville, Calif., where gas was turned into distribution system on October 18.

First Air-Butane Unit *at* Work

THE first air-butane gas plant on the Pacific Coast was officially placed in service by the Natural Gas Corporation of California in the town of Vacaville, Calif., on October 18, 1930.

To this small community went scores of gas men, manufacturers and gas appliance distributors, all interested in this significant forerunner of a new extension of gas service that is expected to be of tremendous importance within the next few years.

Mayor Gray of Vacaville and his board of trustees were there to receive from R. E. Aitcheson, vice-president of the Natural Gas Properties, Inc., the key with which to turn on the main city service. Prominent citizens of the town were present and spoke appreciatively of the honor that they felt had been conferred upon them in giving them, first of any municipality in the West, the new gas service.

As Mayor Gray pressed the button that started the compressor and then turned on the service, a hundred homes in the city, where appliances had already been installed, began to use the new fuel. Commercial Manager T. E. Bartlett, overseeing a crew of service men, saw to it that every house was visited and every appliance checked for satisfactory adjustment immediately after the flow of gas had started.

J. K. Firth, vice-president of the Standard Oil Co. and head of its Fuel Oil and Asphalt Division, and E. F. English, president of the Natural Gas Properties, Inc., and vice-president of the Pacific Public Service Corp., were both interested spectators.

The plant, which was designed by Thebo, Starr & Anderton, was constructed under the direction of the gas company by Lindgren and Swinnerton, San Francisco contractors. E. M. Lindsay of the Standard Management & Operating Corp., was the engineer in charge of the work.

The Natural Gas Corp. of California is a subsidiary of the Pacific Public Service Corp., which is in turn controlled by the Standard Oil Co. of California.

The company's representative in Vacaville, who will be in charge of the activities there is G. H. Merritt.

Mayor R. C. Gray, officially turning on butane service in Vacaville, Calif., witnessed by E. F. English (at right), vice-president, Pacific Public Service Corp., and R. E. Aitcheson, vice-president, Natural Gas Corp. of California

J. M. YARBERRY ON SO. UNION STAFF AT ALBUQUERQUE

E. O. Donohue, district manager of the Albuquerque Natural Gas Co., Southern Union subsidiary at Albuquerque, N. M., announced on October 21 that J. M. Yarberry has been named as general superintendent of the Albuquerque company and will be in charge of production and transmission. Mr. Yarberry has been actively engaged in the distribution of natural gas for many years, and is the oldest employee of Southern Union from the standpoint of service. During the laying of the pipe line now serving Clovis and Portales, N. M., Farwell and Texico, Texas, he acted as superintendent.

Mr. Donohue, district manager, will be in charge of all offices in the Albuquerque system, and also of the one in Santa Fe.

A. P. I. MOVES PACIFIC COAST OFFICE TO LOS ANGELES

The American Petroleum Institute has announced that its Pacific Coast office has been moved from San Francisco to 530 West Sixth St., Los Angeles, Calif.

Minnesota Northern Heating Drive

Housecleaning Is Not Dreaded..
in the home with good gas heat,
Because gas is the cleanest known fuel—no soot, no dust, no ashes—your draperies, furnishings and linen stay clean much longer, and never get as soiled as with other fuels.
Your walls and woodwork do not turn to a dingy gray.
The colors in your draperies and upholstering stay bright and fresh when you have good gas heat.
Montana-Dakota Power Co.

Typical advertising message prepared for sales tie-in.

MINNESOTA Northern Power Co. has under way a house heating campaign with a quota set of 1,000 new customers by December 1, 1930. Any type of house-heating customer—whether conversion, hot water, warm air, or circulating—counts toward the quota so long as gas is the sole means of heating the new domestic or commercial customer's premises.

Cash prizes to the amount of $1,000 are being offered the sales organization by the company. Individual sales quotas have been set up for each of Minnesota Northern's subsidiaries—Montana Dakota Power Co., Northwest States Utilities, and Bowdoin Utilities Co.

Several manufacturers are cooperating by offering a cash prize per unit sold during a special week of the campaign. Thus there will be a special furnace week, boiler week, etc.

To open the campaign a broadside was prepared, showing cuts of gas-heated homes with names, addresses and itemized yearly statement of gas consumption of customers on the company's own lines. A 60-page book, 8½x11 inches in size, with leatherette cover, was also prepared for the sales force, giving the same type of information for 60 of the company's gas heating customers. Houses shown ranged from 4 to 14 rooms, and care was taken to illustrate both conversion jobs and special gas constructed installations for each size house. The contents of the book are visible evidence of gas service for house heating purposes and make the book an effective help in direct sales work.

A series of 19 gas advertisements were prepared and sent to each division. Manufacturers literature and other sales aids are being mailed twice a week to each division headquarters.

The Minnesota Northern Power Co. headquarters in Minneapolis and operates its properties at long distances, the closest being about 400 miles, at Bismark, North Dakota. The various division offices are located in North Dakota, Montana, South Dakota, and Wyoming. Due to this factor of distance, it is necessary to plan sales activity well in advance.

Friday night, November 28, will end the present house heating campaign being conducted by the company.

COMMUNITY NATURAL SELLS 200 HEATERS A WEEK IN CAMPAIGN

Community Natural Gas Co., of Dallas, Texas, distribution unit of the Lone Star organization, in giving results of its recent space heater sales campaign, announces that heaters to the number of 200 per week were sold. The campaign was launched August 15 and continued until the company's entire territory was covered.

Two crews were used, each consisting of from 10 to 12 men. Preparatory to beginning the campaign all salesmen were called to Dallas to participate in a discussion of details. S. E. Kerr, new business manager for Community Natural, outlined the drive, and was assisted by C. L. Trevitt of the same department.

ELWOOD-VENTURA CARRIER TO BE FINISHED BY DEC. 1

Southern Counties Gas Co.'s 32.5-mile 16-inch line from the Elwood Fields north of Santa Barbara, Calif., to Ventura on the south is making good headway. The section south to Carpenteria will be completed by November 15, and the Carpenteria-Ventura section by December 1, according to M. R. Thomson, vice-president in charge of construction. Two gangs are at work on the line.

OWNERSHIP CHANGE IN CENTRAL WEST PUBLIC SERVICE CO.

The Public Utility Holding Corp. of America has acquired 50 per cent of the outstanding voting stock of the Central West Public Service Co., which controls the Dakota Public Service Co., Jamestown, N. Dak., and the Central West Public Service Company of Nebraska, owning plants at Sheldon, Iowa, and Columbus and Norfolk, Neb.

W. H. BERRY TAKES POST WITH NATURAL GAS CORP. OF WASH.

W. H. Berry, president of the Sedro-Woolley Chamber of Commerce, has accepted the position of district manager of the Natural Gas Corporation of Washington, covering the territory north of Seattle. Mr. Berry was formerly secretary of the Skagit Steel and Iron Works.

THREE MISSOURI FRANCHISES TO GENERAL UTILITIES CO.

General Utilities Co., Kansas City, has secured gas franchises in Cameron, Lathrop and Smithville, Mo.

GREAT FALLS GAS CO. CONTRACTS TO HEAT COURT HOUSE

A contract has been entered into by the Great Falls Gas Co., and the board of commissioners of Cascade County for heating the county court house and jail at Great Falls, Mont.

The estimated cost of heating the buildings is substantially below the actual cost of heating with coal in 1929, which was approximately $4,300.

DRUMHELLER IN FRANCHISING ACTIVITY IN MONTANA, IDAHO

Jerome Drumheller, representing interests of Spokane, Wash., has applied to Kalispell and Whitefish, Mont., and Wallace and Kellogg, Ida., for gas franchises. It is reported that the gas will be brought from the Cut Bank area in Montana, and that the line will extend to cities in the northwest coastal area.

PACT GAS CO. ASKS COYLE, OKLA., FOR FRANCHISE

Pact Gas Co., Cushing, Okla., of which R. M. Tuttle is president, has applied for the natural gas franchise at Coyle, Okla. The matter will come to a vote on November 12. The company has just completed a natural gas distribution system at Agra, and also distributes gas at Perkins, Vinco and Tyron.

WARNER, OKLA., TO BE SERVED BY QUINTON NATURAL

Warner, Okla., will have natural gas service through the mains of the Quinton Natural Gas Co., Quinton, Okla. The supply will come from a pipe line which has been constructed from the Quinton field to Muskogee and other points.

HARDENDORF BUYS FRANCHISE AT ULYSSES, KAN.

Fredell Construction Co., represented by A. J. Hardendorf of Dodge City, Kan., has purchased the natural gas franchise at Ulysses, Kan. The city will be served by the transmission line to Lamar, Colorado.

L. A. G. AND E. TO BUILD AT INGLEWOOD, CAL.

The Los Angeles Gas and Electric Corp., of Los Angeles, Calif., has announced plans for the erection of a two-story office building to be erected at a cost of $150,000 in Inglewood, Calif.

DIXIE GAS AND FUEL WILL ADD CLEVELAND TO TOWNS SERVED

Cleveland, Texas, is soon to be added to the mains of the Dixie Gas and Fuel Co., distribution unit of the Dixie Gulf Gas Co., which is a United Gas Company subsidiary.

1930-1931 Calendar

Southwestern Regional Natural Gas Sales Conference—Dallas, Texas, November 13 and 14, 1930.

Southern California Meter Association—Los Angeles, California, November 19, 1930.

Pacific Coast Gas Association—Regional Conference, San Francisco, Calif., November 20-21, 1930.

Western Metal Congress and Exposition—San Francisco, February 16-21, 1931.

Natural Gas Department, A.G.A.—Annual Convention, Memphis, Tenn., May, 1931.

American Gas Association—Annual Convention, Atlantic City, Oct. 12, 1931.

NOV. 10 IS COMPLETION DATE FOR SO. CAL. GAS CO. EXTENSION

From its Buena Vista Hills Junction the Southern California Gas Co. is laying 7½ miles of 22-inch pipe line south to its Station 40. The Buena Vista Hills Junction is the company's southern terminal of the Kettleman Hills line, recently put in service, and Station 40 is the main line station pumping gas to Los Angeles. November 10 is announced as completion date for the line extension. Construction work is being handled by the gas company under direction of H. P. George, general superintendent, welders being furnished by the A. O. Smith Corp.

BIG SPRING PUBLIC SERVICE CO. HOLDS APPLIANCE DISPLAY

The Big Spring Public Service Co. of Big Spring, Texas, held a special display of gas appliances during the first week in October. A store in the new Settles Hotel was rented for the purpose, and the company reports a successful sale of ranges, water heaters and househeating appliances. The first day of the display also marked the opening of the new hotel.

A. D. KERR APPOINTED MANAGER OF NORTHERN TEXAS UTILITIES

A. D. Kerr has resigned his post with the Public Service Company of Oklahoma to accept a position as manager of the Northern Texas Utilities Co., and affiliated gas properties, recently acquired by the United Gas Company of Houston, Texas. Mr. Kerr's headquarters will be in Wichita Falls, Texas.

SURVEYING MONTANA-DAKOTA LINE FROM WILLISTON TO MINOT

A survey is now being made by the Montana-Dakota Power Co., headquartered at Minneapolis, Minn., looking toward the extension of the recently completed Williston line to Minot, North Dakota, a distance of more than 100 miles. The Minot Gas Co. is now distributing manufactured gas in that town.

"NATURAL" TURNED INTO TURLOCK MAINS EARLY IN OCTOBER

Natural gas was turned into the mains at Turlock, Calif., early in October, the supply coming from the Pacific Gas and Electric Company's main transmission line from Kettleman Hills fields. Turlock Gas Company, local distribution unit, was purchased by P. G. and E. some time ago.

ANOTHER FRANCHISE PETITION ON FILE AT REGINA, SASK.

Col. C. E. Gregory, K.C., has applied to the city council of Regina, Saskatchewan, for permission to serve that city with natural gas, the fuel to be brought from Turner Valley, Alberta. Col. Gregory represents independent oil operators of Turner Valley.

ROBERT L. KIDD GEOLOGIST FOR CITIES SERVICE GAS CO.

Robert L. Kidd has been appointed to headquarters staff of the Cities Service Gas Co., Kansas City, Mo., as geologist. He was formerly resident geologist in Kansas for the Empire Oil & Refining Co.

ACETYLENE ASSN. IN ANNUAL SESSION IN CHICAGO

The Thirty-first Annual Convention of the International Acetylene Association will be held at the Congress Hotel, Chicago, November 12, 13 and 14.

United Gas Building *at* Houston

PLANS for immediate construction of an 11-story $1,250,000 office building in the center of the business district of Houston, Texas, have been announced by the United Gas Corp., headquartered in that city.

Details of construction plans were made public recently by N. C. McGowen, president and general manager of the United Pipe Line Corp., successors to the Moody-Seagraves Gas Companies.

The United Gas Building will be used to house the companies associated in the recently formed United Gas System and will be located adjacent to a new Chamber of Commerce building at Main Street and Walker Avenue. It will occupy a plot of ground 100 feet by 125 feet, fronting on Walker Avenue and Travis Street.

The ground floor, basement and second floor will be occupied by the Houston Gas and Fuel Co., distributing unit in Houston for the United Gas System. General offices and gas appliance display rooms, together with a department of home economics and domestic science which is to be inaugurated in the near future, will be installed by the Houston Gas and Fuel Co. in the space allotted to it.

The remaining floors of offices are to be occupied by the United Pipe Line Corp., the United Production Corp., and the United Gas Distribution Co., all United Gas Corp. units.

Foundation and steel framework of the United Gas Building will allow for addition of five additional floors as the company's business grows and expansion plans demand more room.

Alfred C. Finn, architect in charge of plans for the building, has designed a structure to fit the special needs of the United Gas System, and every modern feature in building construction will be utilized. Construction will be under the direction of the Southern Loan and Investment Co., and the building is expected to be ready for occupancy by September, 1931.

IMPROVEMENT IN GAS SERVICE FOR KANSAS CITY SYSTEMS

Construction work looking toward the improvement of gas service in Kansas City, Mo., and Kansas City Kan., is being started by Cities Service Gas Co., Kansas City Gas Co., and the Wyandotte County Gas Co. Total cost of the improvements will be over $500,000.

The Kansas City Gas Co., has begun construction of a 30-inch line to augment the supply coming into the Missouri city. The new line will cost approximately $285,000.

Wyandotte County Gas Co., Kansas City, Kan., is laying a new 16-inch main line from the city gate to tie in to the local distribution system. This work will probably cost about $100,000.

Cities Service Gas Co., parent organization of these two companies, is just completing the laying of a main which will enter the border station of the Wyandotte County Gas Co., and the Kansas City Gas Co. Estimates place the cost of this line at $175,000 The entire project is expected to be completed before extreme cold weather sets in.

HAGENAH ON DIRECTORATE OF BYLLESBY SUBSIDIARIES

William J. Hagenah, vice-president and special counsel of the Byllesby Engineering and Management Corporation, has been elected a director of the following companies: Northern States Power Company (Delaware), Northern States Power Company (Minnesota), Northern States Power Company (Wisconsin), Louisville Gas and Electric Company (Delaware), Louisville Gas and Electric Company (Kentucky), and Louisville Hydro-Electric Company (Delaware).

MONTANA POWER CO. ENTERS GAS FRANCHISING ACTIVITY

The Montana Power Co., of Helena, Mont., has applied to the city council of Butte for a franchise to take natural gas to that city. According to current reports from the press of that section, the company will expend approximately $12,000,000 to $15,000,000 for building a line to Butte, Anaconda, Deer Lodge, serving both industrial and domestic consumers in that territory. The company controls the Butte Gas and Coke Co., now holding the franchise in that city, and is asking for the Deer Lodge and Anaconda franchises. It is reported also that the company has applied at Livingston and Bozeman.

Frank M. Kerr, vice-president and general manager, is named as carrying on the franchising activity for his company.

Elections for voting on the Butte and Anaconda franchises were scheduled to be held on October 28 and 29.

JAMES W. KERR, PIONEER OF APPLIANCE INDUSTRY, DIES

James W. Kerr of the Steiger & Kerr Stove and Foundry Co., died recently at his home in San Francisco, at the age of 85. Mr. Kerr was born in Edinburgh, Scotland, in 1845, attended the University of Edinburgh in his youth and came to California in 1868. In 1872 he became a partner of the late Charles Steiger, Sr., in the enterprise which is still known by the name of Steiger & Kerr.

Mr. Kerr was a well known civic leader and political figure in the early days of California history. He served as chairman of the Committee of One Hundred which drew up the first city charter for San Francisco, organized and was chairman of the Home Industry League which has since grown into the California Development Association.

In 1893 the foundry first undertook the manufacture of stoves which has continued and developed to the present time.

The deceased is survived by two sons, Andrew and Lansing, and a daughter, Mrs. Charles Hulme.

LINE TO BUFFALO AND SHERIDAN, WYOMING, NOW IN SERVICE

The natural gas transmission line from the Billy Creek field in Johnson County, Wyo., to Buffalo and Sheridan is now completed and in service. The 8-inch line is 55 miles long, and is owned by the Northwest States Utilities Co., headquartered in Great Falls, Mont., a subsidiary of the Minnesota Northern Power Co., of Minneapolis, Minn.

Visual Operating Data *an* Aid *to* Management

No. 28 is for the base pressure of the Industrial sales.

The third section is devoted to observations of temperature, specific gravity and B.t.u. of the gas at the town border station.

The fourth section is for the remarks of the local man to explain any unusual features of his operations during the month.

On the next page there is a section for the listing of the footages of each size and kind of main, cast iron and steel, high pressure and low pressure. This shows the amount of each size installed or removed during the month and the total in service at the end of the month. There is also a line for figuring the 3-inch equivalent.

The next section is for information in regard to regulators; district, industrial and house regulators. Then there is a section for services and another for meters. The last section is for information in regard to gas storage facilities.

In order to visualize the details of these reports, a set of graphs is maintained in the general offices in Houston. The curves are drawn in ink on transparent cross section paper of ordinary letter head size, i.e., 8½ by 11 inches. Each one is numbered and indexed and carries a serial letter. Series E, for example, shows the domestic sales per meter, No. E_1 representing the consolidated or general average sale per meter. Nos. E_2, E_3, etc., contain similar curves for each particular town.

The cross section paper used contains 200 small squares horizontally for the abscissa and 100 vertically for the ordinate. These small squares are drawn in sections of five, making 40 larger squares one-quarter inch wide horizontally. By making each of these squares represent a month, there is room for 36 months on a single sheet. All graphs are redrawn at the beginning of each year and the curves of the two complete preceding years are shown with space left for the current year's results to be drawn in month by month as the figures become available. By this means the manager has a quick method of comparing any month's operations with those of a year ago and of two years ago.

All phases of the operations of the distribution company are made instantly available to the manager in graphic form each month when he is furnished with a blue print of each graph as soon as the latest month's data have been drawn in. A complete set of prints replaces that of the preceding month. Prints are also sent to the managers of districts and cities, each man receiving those that pertain to the city or towns under his jurisdiction. Those previously sent out are destroyed by each one, when he receives his new set, except that those sent out in January, showing three complete years, are filed and not destroyed.

The subjects covered by the graphs are many and varied and are chosen as the vital points in operating, points which have to be watched carefully by an efficient operating head.

All graphs in Series A pertain to operating expenses. As a district or a town grows by the addition of new towns and new meters, the operating expenses naturally increase. The curves representing operating expenses take care of this increase by showing the per meter figures. On one sheet are drawn curves for the total operating expense, the total without taxes, the distribution system operation, maintenance, commer-

(*Continued from Page 30*)

cial expense, new business expense and general and miscellaneous expense, all on a per meter basis; that is, the total number of active meters in the district or the town is divided into each of the items mentioned above, as taken from the financial report furnished by the accounting department. The figures used in plotting the curves are recorded in a loose leaf note book which contains a sheet for each graph, numbered serially like the graphs.

Pipe line company graphs in Series A show expenses based on thousands of cubic feet sold while production company expenses are plotted in cents per thousand cubic feet produced.

Series B. graphs pertain only to distribution companies and districts, individual towns not being considered separately. Merchandise and jobbing gross and net revenues per active meter are plotted. The number of active meters is obtained from the operating reports and the revenues from the financial statements.

Eastern Office Opened By Western Gas

WESTERN GAS announces the opening of an eastern office located at 110 E. 42nd St., New York City. The office is in charge of Craig Espy, who has been appointed eastern manager for this publication. Mr. Espy has served as Mid-Continent manager with headquarters at Dallas, Texas, for the past three years. The Dallas office of *Western Gas* is now located in the Wholesale Merchants Building, in charge of Joe Buckingham.

Figures used in Series C are obtained entirely from the operating reports. These curves depict the total gas handled on the delivery base, the total corrected to the standard base, the domestic sales in thousands of cubic feet and the industrial sales in the same units. The manager can see at a glance the effects of seasonal loads and the general trend of the business.

Each sheet in the D series has five curves, all data being taken from operating reports. Thousands of feet of unaccounted-for gas, both apparent and actual (on an equalized pressure base) and thousands of feet of unaccounted-for per mile of 3-inch equivalent, both apparent and actual, and the number of active domestic meters are plotted month by month.

The E curves are also based entirely on the operating reports. Each of these shows the domestic sales per meter, the miles of main, the miles of 3-inch equivalent main, the percentage of unaccounted-for, apparent and actual, and the active meters per mile of main.

Series F contains graphical information in regard to important industrial consumers. The quantity of gas delivered and the revenue derived from it are both plotted. For towns and districts small industrials are grouped by classes, such as bakeries, coffee companies, hospitals, laundries, manufacturers, etc.

Figures for the G curves are obtained by dividing the revenue from domestic sales by the number of domestic meters and also by the thousands of cubic feet sold. The E, F, and G curves are of immense value to the management in making budgets and estimating sales and revenues in towns that desire gas service.

The H curves show degree day deficiencies in certain cities having government weather bureaus.

The I series depicts various details that are watched by the careful manager. These pertain to accounts receivable per meter, both merchandise and jobbing and total; also materials and supplies per meter. This information comes from the balance sheets of the financial reports.

The J curves are made from the company financial reports and show gross revenue, net revenue before deducting fixed charges, net revenue before deducting depreciation and amortization and, finally, the profit or loss.

The K series is for distribution companies and pertains to the number of complaints, classified, per meter.

The L curves are for production companies and there is one for each well. The ordinate of each point is the working pressure of the well in pounds per square inch, while the abscissa is the thousands or millions of cubic feet delivered.

The final series (M) is devoted to delinquent accounts. The dollars per meter are plotted.

This complete set of curves does not, of course, contain all of the information that is required by the management, but it is laden with a wealth of information presented in such form as to be a time saver. Certain of the curves can undoubtedly be improved upon. For example, the unaccounted-for gas curves in series D have been found hard to read intelligently, because of the great variation from month to month. Supplementary graphs have been made of these, wherein are depicted the cumulative amounts of unaccounted-for for 12 months. Thus general trends are better shown, while changes for the better or worse do not immediately appear. In fact no such curve can be started for a new town until it has been operating a full year.

Graphs have always been the boon companions of trained engineers, and now they are becoming friends and guides of district managers and local agents, who look forward to their arrival each month with the same anticipation that precedes the coming of the pay check.

BILLINGS GAS CO. REPORTED PLANNING MAJOR CARRIER

The Billings Gas Co., of Billings, Mont., has petitioned to the Butte city council to call an election for voting on the granting of a natural gas franchise to the company. It is reported that the company plans construction of a natural gas transmission line to Butte and Anaconda from southwest Montana or Wyoming fields.

Construction *of* Butane Systems Makes Headway

WITH franchising activity progressing successfully in Oregon and Washington, the Natural Gas Corp. is announcing plans for going ahead with construction of plants and distribution systems for the service of butane gas in the franchised territory.

Systems are actually under way in Bend, La Grande, Coquille, Hood River, Klamath Falls, and the Dalles, Ore., and new franchises have been granted in Cottage Grove and Tillamook, and orders for the pipe and equipment have been placed.

The Washington program calls for immediate erection of plants in Arlington, Camas, Port Angeles, Port Townsend and Shelton. Franchises have been granted during the last few weeks to the corporation to serve Anacortes, Mount Vernon, Raymond, and Sedro-Woolley.

It is estimated that the Natural Gas Corporations of Oregon and Washington will spend approximately $2,250,000 in construction of plants and distribution systems in the two states.

T. R. Weymouth Vice-Pres. *of* Columbia Engineering

THOMAS R. WEYMOUTH, chairman of the board of directors of the Oklahoma Natural Gas Corp., has announced his resignation as an official of the Oklahoma Natural and its affiliated interests, effective November 1, to accept a position as vice-president of the Columbia Engineering and Management Corp., with headquarters in New York City.

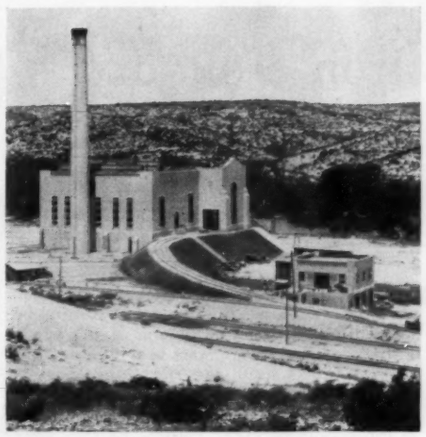
T. R. Weymouth

Mr. Weymouth, who became president of the Oklahoma Natural in 1928 and chairman of the board this year, was graduated from Massachusetts Institute of Technology as an electrical engineer, following which he spent five years in the design and construction of hydroelectric power systems. In 1903 he entered the oil and gas fields in Pennsylvania and since that time has been engaged in engineering and executive capacities with several large gas companies.

Mr. Weymouth has acted as a consulting engineer in rate procedures both in the United States and Canada. He invented the orifice meter for measuring gases, an integrator for computing orifice meter records and several other devices for use in the oil and gas industry. He is the originator of the pipe line flow formula bearing his name.

For many years Mr. Weymouth has been active in associations including the American Society of Mechanical Engineers, of which he was recently elected vice-president; the Natural Gas Association of America, and the American Gas Association.

His successor as chairman of the board of directors of Oklahoma Natural Gas Corp., has not been named.



LEFT: Central Power and Light Co. power house near Del Rio, Texas—principal consumer on Texas Gas Utilities Co. pipe line. RIGHT: A section of the 10¾-inch gas carrier.

Del Rio Line Serves Power Plant

TEXAS Gas Utilities Co., subsidiary of Appalachian Gas Corp., was organized in April of this year to develop the natural gas industry in Val Verde, Maverick, Uvalde, Dimmitt and Zavala counties, including the "Winter Garden" district of Texas. Among cities and towns in the area are Del Rio, Eagle Pass, Uvalde, Crystal City, Carizzo Springs, Asherton and Catarina, while across the Rio Grande, opposite Eagle Pass, is the Mexican city of Piedras Negras.

Although but six months old, Texas Gas Utilities Co. has already begun a program of construction. The initial development was the laying of a pipe line from Rycade field in Maverick County to the electric generating station of Central Power and Light Co. located 12 miles west of Del Rio on Devil's River. Work was started in May and the line was completed in July.

The line is approximately 64 miles long, almost straight for 43 miles, with a gentle curve in the remaining 21 miles. It is constructed of 10¾-inch steel pipe, factory-welded and delivered in 60-foot joints, a new feature in pipe line construction.

Each joint was tested and examined before leaving the factory. The entire line is electrically-welded. Gate valves, installed with Dresser couplings, are placed in the line at 10-mile intervals. River clamps, set in concrete, are used at several small river crossings. By means of a private telephone system extending the entire length of the line, communication is maintained with stations along the right of way.

Upon completion the line was subjected to an inspection under a pressure of 600 pounds per square inch. Working pressure to be carried is from 150 to 200 pounds per square inch.

Construction work was completed in a little over 60 days.

Through this line Texas Gas Utilities Co., besides furnishing under long-term contract entire fuel requirements of the Devil's River station of Central Power and Light Company, will also supply industrial and domestic consumers in Del Rio. At the present time gas is being delivered to the power company at the rate of approximately 5,000,000 cubic feet daily, representing an increase of 100 per cent over original deliveries early in July, when consumption was 2,500,000 cubic feet daily.

Construction has recently been completed of the Del Rio and Eagle Pass distribution systems, as well as of the main pipe line extending from the Rycade field to Eagle Pass, thence to the middle of the International Bridge. Work on the main pipe line from the Zavala field to Crystal City and the "Winter Garden" is being completed, with schedules calling for placing the line in service late in October.

Natural gas will provide a source of power for pumps for the extensive pumping of water on irrigated farms in the "Winter Garden." The "Winter Garden" derives its name from the fact that fine crops of vegetables, oranges and grapefruit are grown in this section, which is cultivated the year around. Shipments of products have increased more than 500 per cent in the past eight years, and the introduction of natural gas should further stimulate this remarkable development.

At the present time there are more than 500 water-wells in the district, with new wells being drilled at the rate of approximately 100 per year. The water is found at depths ranging from 25 to 1,200 feet. It is this water supply, combined with the rich soil, which permits cultivation during all seasons. Diversified farming, dairying and cattle raising assure this section a continuing and prosperous growth.

Officers of Texas Gas Utilities Co. are H. G. Scott, president; H. E. Danner and D. H. Tucker, vice-presidents; E. F. Berberich, secretary; J. B. Bell, treasurer.

MONTY PHYL TO HAVE CHARGE OF GAS SALES IN FRESNO DISTRICT

Monty Phyl has been named to take charge of the gas sales division of the Fresno District for San Joaquin Light and Power Co., Fresno, Calif., subsidiary of Pacific Gas and Electric Co. Mr. Phyl was formerly sales manager for the Great Western Power Company in the Sacramento Division.

CITIES SERVICE GAS CO. ADDING TO OTTAWA COMPRESSOR

Cities Service Gas Co., Kansas City, Mo., is installing two additional Cooper engines in the compressor station of the company at Ottawa, Kan. The new units necessitate additions to the compressor building, and a new building is being constructed also.

Gas *in a* Gray Iron Foundry

(*Continued from Page 37*)

times increased to around 425° and the time of baking was determined through comparison of results for equal loads. While this time of baking could have been expedited by increasing the gas flow, it was shown that a slower bake produced much better results than a faster heating and resulted in higher efficiency of operation due to lessened stack losses.

A brief summary of the heat balance is given in Table No. 2, in which "Heat Used by Cores" includes the heat used for evaporating the liquid in addition to heating the sand to 400° F. The stack loss and heat stored in the iron were, of course, known quantities; the item for "Other Heat Losses" was determined by the difference between the sum of the other heat usages and the total heat input. At first glance the heat stored in the iron car and plates would seem to be a total loss, which would in fact be true if the load of cores were withdrawn from the oven while at 400° F., but the practice is to allow the load to cool off inside the oven for approximately 6 hours, so that a great deal of the heat in the iron undoubtedly does some useful work on the cores. The total weight of the car and core plates was considerable and no doubt a great deal can be done in the future to lessen this item, although much resistance to such a plan will be raised by foundry managements who insist on heavy plates to prevent warping of cores. However, the items of principal interest in this heat balance are the "Heat Used by Cores," amounting to 32.8 per cent of the total, and the "Heat Losses" due to storage, radiation, etc. This last item, amounting to only 14.9 per cent of the total heat input, was without doubt kept at such a low figure by the application of insulation to the interior of the oven.

The oven performance was extremely good, a more uniform and more rapid bake being possible due to an even distribution of heat and an accurate temperature control (recording pyrometers showed a maximum variation of only 50° F. in temperature between the very top and bottom of the oven). This was in direct contrast to a similar sized oil-fired oven used for the same class of work where a certain number of cores would be either overdone at the top or underdone at the bottom of every load. "Re-run" cores (cores put back into an oven for additional baking), barring exceptional cases, were not associated with this installation. In fact, the oven showed particular aptitude for turning out cores in one bake that formerly required "re-running" when baked in ovens heated by other fuels, and before many days this oven became a thing to depend on for rush orders.

The results of these two successful installations thoroughly convinced the foundry management of the merits of gas for baking cores, and they proceeded with the conversion of the plant until a total of eight so-called "day" ovens and five car-type "night" ovens were heated by gas. These ovens are of various sizes and are called upon to do various kinds of work. Fig. 4 shows a pair of ovens, designed to hold racks of cores moved in and out of the ovens by a lift truck, which have gas-burning systems similar to the one mentioned above, with the addition of perforated pipes for secondary air running the length of the burners and connecting to the atmosphere at both ends of the oven.

It remained, however, for natural gas to furnish the necessary impetus to effect that complete conversion of the remaining ovens in this shop. While gas had been adopted as standard over coke, the use of oil still persisted in three mold and core ovens due to much lower fuel cost. The introduction by the Pacific Gas and Electric Company into the San Francisco Bay district of a natural gas of approximately double the heating value of the old 550 B. t. u. manufactured gas resulted in a lowering of fuel costs of nearly 50 per cent to this consumer. As a consequence the slight margin of power wielded by the oil fuel disappeared and the result was the immediate conversion to gas fuel of all three oil-fired ovens. Natural gas had provided a long-felt want for a cheaper, better fuel and it took the place of the old manufactured gas with very little confusion, the necessary adjustments in the gas-burning equipment described above being confined to increasing the burner port areas by approximately 100 per cent and decreasing the gas spud areas to pass approximately the same number of heat units as before.

Another conversion which has been of great practical benefit to the foundry company has been the change-over from coal-oil "skin-drying" torches to gas burners. Here again the management was frankly skeptical of gas efficiency, due to the higher heat-unit cost of gas for this admittedly wasteful application, but were again convinced through the medium of a trial. The gas torches are considerably lighter than the old-style torches, and as a consequence permit of a more free usage, and utilizing the gas at 12 pounds pressure direct from the shop distribution system, they inspirate the air for combustion direct from the atmosphere, so that the operator enjoys the convenience of a single valve control. To the management this change-over has meant better results, a saving of hours and hours of time formerly spent in filling and lighting the old oil torches, a saving of thousands of pounds of compressed air to operate them and the elimination of the hazard of oil containers under pressure.

No modern shop would be complete without hot water service for the workmen's lavatories and showers. Gas provides this ever-ready comfort at the Macaulay Foundry through the medium of a multicoil type water heater connected to a large insulated storage tank. The cost is very nominal and the management feel amply repaid for the expense by the good will engendered among the workmen.

The advent of natural gas has been a great benefit and an economy to all industry in the San Francisco Bay area, as exemplified particularly by the Macaulay Foundry Company. Satisfied before that gas was the superior fuel for their usages, it follows that they are now doubly pleased with the conversion from other fuels. Experience has shown them that not only is gas cheaper, but that it is easier to handle, is a time saver, a production aid, a money maker for the employer and a good-will missionary to his employees. Gas, having accomplished these results, stands out again as the superior fuel.

TABLE NO. 1

Weight of Green Cores—lbs.	3,364
Weight of Baked Cores—lbs.	3,095
Weight of Liquid Evaporated—lbs.	269
Weight of Iron in Car and Plates—lbs.	11,032
Initial Temperature—Cores and Iron—° F.	70
Initial Temperature—Oven—° F.	200
Final Temperature—Oven and Cores—° F.	400
Hours to heat to 400° F.	3.67
Hours held at 400° F.	2.33
Total Heating Period—hours	6.00
Gas Pressure—lbs. per sq. in.	1.25
Gas Consumption, cubic feet (550 B. t. u.)	2,830
Cubic feet of gas per hour—average	470
Gas cost at 75c per M. c. f.	$2.12
Cubic feet of gas per lb. of cores	.838

TABLE NO. 2

	B.t.u.	*Cu. Ft. Gas*	*Per Cent of Total*
Heat used by cores	509,400	926	32.8
Heat stored in iron	400,000	727	25.8
Stack loss	410,800	747	26.5
Other heat losses (storage, radiation, etc.)	230,800	420	14.9
Total	1,551,000	2,820	100.00

W. J. VAN SLYKE, FORMER OKLA. NATURAL EMPLOYEE, DIES

W. J. Van Slyke, widely known to the gas industry in the Southwest, died on October 19 at Rogers, Ark.

Mr. Van Slyke first entered the natural gas industry in 1909 with the Henry Oil and Gas Co. He was later connected with the Empire Co. and from 1918 to 1928 was a meter inspector for the Oklahoma Natural Gas Corp. He resigned from the Oklahoma Natural in 1928 on account of ill health.

Mr. Van Slyke is survived by his widow, three daughters and a son, C. M. Van Slyke, field superintendent of the Oklahoma Natural properties at Iola, Kan.

Moore's Puritan

Easy and Safe to Use!

The letter and photograph shown here constitute a most remarkable demonstration of the safe, effortless, efficient gas heat provided by Moore's Puritan. It is easy to see why Moore's Puritan is not only a good seller — but a powerful builder of good will.

Moore Brothers Co.,

Joliet, Ill.

Gentlemen:

I wish to say that I purchased one of your Moore's Puritan Seventeen Gas Circulators and have heated my six room house at a satisfactory degree when the temperature was sixteen degrees below zero.

*While I cannot see the heater, I can operate it with ease and have found it to be safe and reliable.

I wish you many more years in the heating business.

I want to tell my friends who may be thinking of buying a Moore's Heater to be sure to have plenty of space to heat.

(Signed) A. L. Benefiel
412 S. Douglas
Lee's Summit, Mo.

*Mr. Benefiel is blind

The 18 Series Puritan provides positive circulation plus an abundance of cheerful, controllable radiant heat. It is the last word in gas heaters. » » » »

The Moore representative in your territory is a trained heating engineer as well as a merchandise specialist. Ask us to have him call and tell you about the Moore line. » » » » » » »

Moore Brothers Company

Joliet, Illinois

Originators of the Circulating Heater

Since 1857

Servicing *of* Gas Appliances

(*Continued from Page 39*)

Owing to warm weather in the fore part of the meter reading period of District No. 17, and continued cold weather through all of the meter reading period of District No. 3, District No. 3 had 299 degree days more than District No. 17; therefore, the heating bill for a home in District No. 3 having the same exposure, the same heat loss, and the family the same living habits, would show a consumption 38 per cent higher than in District No. 17. From the same data it may be shown that the consumption of November could be 435 per cent more than October; January, 94.9 per cent higher than December.

A high bill investigation can be turned into a real contact point, as a constructive service can usually be rendered.

INCOMPLETE COMBUSTION

Some of the most common causes of incomplete combustion are as follows:

(1) Attempting to burn too large a volume of gas in a given space. This is common with radiant type and convection heaters.

(2) In yellow flame heaters, allowing of the tip of the flame to touch the metal of the heater.

(3) Using appliances designed for manufactured gas or natural gas without adequate adjustment.

(4) Clogging of air shutters by lint and other foreign particles.

(5) Improperly designed appliances causing not enough air to be mixed with gas.

When an unvented water heater is found in a bath room, we require it to be vented or moved immediately.

In case of an unvented water heater in a new home, service is refused by our inspector until it is properly vented.

If the service man finds that it is impossible to adjust an appliance, and it is so used that it presents a hazardous condition, it is his duty to condemn the use of it.

A record of this appliance is kept and a follow-up made. If the appliance is still in use the appliance is disconnected or service discontinued.

It also may be well to mention here that the house piping is checked, by a meter check, on every service call and a record kept of the test.

A great many service calls can be eliminated and a much better service can be given if all new appliances are actually set up and the different phases of their operation checked and adjusted before they are allowed to be set in customers' homes.

PRE-INSTALLATION SERVICE

Our procedure in servicing new appliances sold by the company is as follows:

First, the appliance is set up and adjusted to the average pressure of our distribution system. This assures satisfactory operation of the appliance from the time that it is set. This also eliminates releasing any burned paint or oil odors into the home of the customer. The setters also make any additional adjustments that might be needed. The salesman then makes a return call to see that the appliance is giving satisfactory service. A service man who does nothing but check new installations then makes a final check.

With the advent of the gas-fired central heating plant in large numbers, the scope of the service department's work has been materially increased. The service demanded by the owners has been most exacting, due of course, to the nature of the load, for when the heating plant fails to function, the customer demands immediate relief, which must be forthcoming in the interests of good public relations.

Central heating plants properly installed and adjusted, with gas pressure regulators and automatic controls, require a minimum of service. Such plants have available the maximum gas requirements during the peak load periods, the pilot lights function properly, and the temperature maintained is constant and sufficient, and due to a rather high over-all efficiency, the bills are satisfactory, thereby eliminating the source of most complaints.

Pilot light extinction on both gas-designed and converted coal jobs, is an aggrevating source of trouble. This condition is due to a fluctuating pressure in the house piping, and can be readily eliminated by the installation of gas pressure regulation on the equipment. This procedure also gives a constant flow of gas to the main burners and thereby gives a higher efficiency and a correspondingly lower consumption. Gas pressure regulators should be installed on all types of thermostatically operated heating equipment.

Another source of trouble is due to faulty flue connections. All central heating plants should be connected to a chimney of sufficient size and height to handle the products of combustion. This flue connection should always contain a draft hood or a check draft to counteract the draft of the chimney and thereby reduce the excess air needed for combustion to a minimum. When gas is the fuel used, the chimney merely serves as a passage way for the products of combustion, as most heating equipment using gas is self-sustaining, as far as draft is concerned. The draft hood also functions as a back draft diverter and prevents the extinction of the pilot and burners in case of a prolonged back draft.

Even though gas-fired equipment does not require the draft of the chimney to function properly, it does require an unobstructed outlet for the products of combustion, in order that combustion can proceed within. Therefore all gas-fired heating equipment should be connected to a chimney in good condition and of sufficient capacity, with as short and as direct a run of flue pipe as possible. The venting of heating equipment through basement walls and into exposed metal stacks is always a source of trouble.

Thermostatic control is essential to the most efficient operation of a gas-fired central heating plant. It is the one thing that pleases the customer most and is responsible to a greater degree than any other one item for the reduction in high bill complaints. As gas is the easiest of all fuels to regulate, it behooves us to take advantage of this characteristic whenever possible.

ALBUQUERQUE-SANTA FE LINE OF SO. UNION COMPLETE

Completion of the Southern Union Gas Company's line to Albuquerque from the San Juan Basin gas fields in northwest New Mexico, is announced by officials of the company. The line to Santa Fe is also completed, and service was begun in the latter city late in October. George L. Fraser is manager for the company at Santa Fe, the new office being recently opened at 115 Don Gaspar Ave.

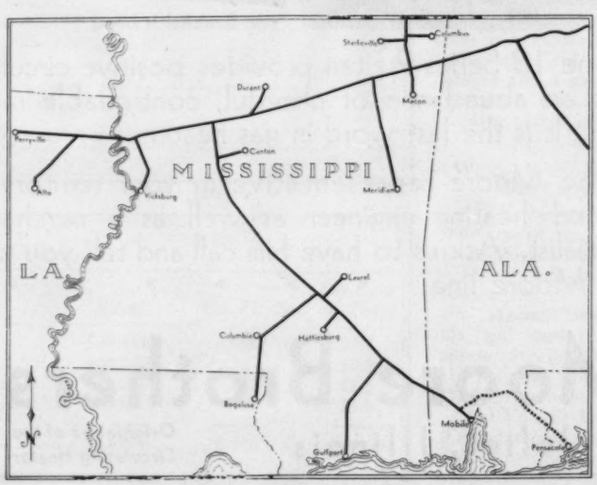
Negotiations were reported late in October as being practically closed for the use of the Albuquerque Gas and Electric Company's distribution system by Southern Union.

The Albuquerque line, with its branch to Santa Fe, represents an expenditure of approximately $5,000,000. It is 175 miles long and is constructed of 12-inch pipe.

SOUTHERN UNION TO BUILD LINE TO FORT STOCKTON, TEXAS

Fort Stockton, in Pecos County, Texas, will be served with natural gas by Southern Union Gas Co., headquartered at Dallas. The supply will come from Pecos Valley fields or from the Perren wells. Franchise was granted by the city in October.

Mobile Line Enters New Gas Area

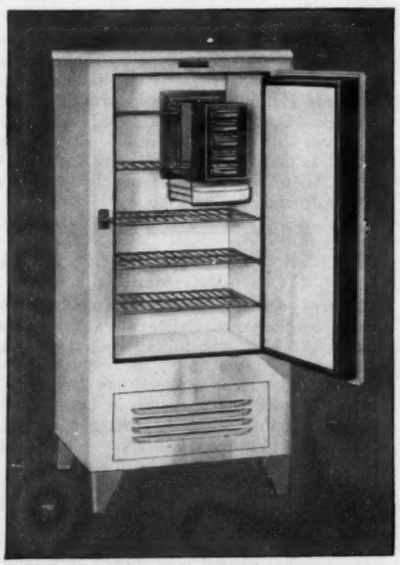


CONSTRUCTION of the 67-mile extension of Southern Natural Gas Corp., from Mobile, Ala., to Pensacola, Fla., is now under way, the line to be completed about December 1, with gas available for distribution near that date. Unusually difficult construction conditions feature the extension. The line traverses 14 miles of almost impenetrable swamp, as well as making two river crossings. Natural Gas Engineering Corp. is constructing the line for the Southern Natural Gas Corp. Dotted line shows the Mobile-Pensacola extension.

This EMPLOYEE SALES CAMPAIGN *sold* 150 ELECTROLUX *Refrigerators*

In 2 months, Southern California Gas Company increases sendout 2,700,000 cu. ft. a year with this special Electrolux offer

"AFTER ALL, aren't the employees of our own company the most logical prospects for gas refrigeration?" The Southern California Gas Company found a most convincing "yes" to their question when they ran a special Electrolux employee campaign recently.



The popular Hostess Model Electrolux, one of the many models which will increase your domestic load approximately 1500 cu. ft. a month.

The primary purpose of this special sales effort was to sell Electrolux refrigerators *to* employees of the company. The privilege of buying an Electrolux at the company's cost, installed, was open to every employee or member of his immediate family. Only a 10% down payment was required. The balance was spread over two years. And there were no interest charges.

The sale lasted two months. In that time, 150 Electrolux refrigerators were purchased.

These refrigerators not only added nearly three million cubic feet to the yearly domestic load, but in addition, gave employees first-hand knowledge about Electrolux with which to answer the questions of friends and neighbors and thus develop important leads.

In the case of the company's appliance salesmen, gas refrigeration selling became more telling because of their close acquaintance with the product right in their own home.

If you've never put on an employee Electrolux campaign, we'd be glad to furnish further details and information about its effective use. Write, wire or telephone Electrolux Refrigerator Sales, Inc., Evansville, Indiana.

ELECTROLUX

THE *Gas* REFRIGERATOR

Payne Furnace & Supply Co. trucks for sales and service organization.

Truck Fleet *for* Heating Service

PAYNE Furnace & Supply Co., Beverly, Hills, Calif., has put into action a fleet of 11 service trucks which are an effective means of tying in sales and service activities of the company. Six new trucks were purchased recently, and the five which were in use last year were traded in on new models, the result being an entirely new fleet. Each car is painted bright orange, with the words "Payne Heat," company trademark, painted on the truck body in black. The name and address of the company appear prominently also. During the early fall months the trucks are being kept busy answering calls for putting heating equipment into proper condition for the winter service. Seven trunk lines have been added to the company's switchboard for the purpose of answering these service calls. Every service call is checked against the company's records to learn the date of installation, location in the house, number of rooms heated, and other data. The service man goes out on a call equipped with the necessary tools to take care of a particular job.

Minimum Costs *in* Gas Pipe Lines

(*Continued from Page 27*)

such wall thickness would result in pipe that could be manufactured and handled satisfactorily.

In this study no additional thickness has been allowed to prolong the life of the pipe against soil corrosion for the reason that, in our opinion, the poorest and most expensive resistant to corrosion is steel.

These curves have been made up using a hoop stress of 15,000 pounds per square inch. If higher stresses than this were used, the same general shape of curves would be obtained except that for the same quantity and diameter of pipe the tons per mile would be reduced in the ratio of 15,000 to the higher stress.

The curves on Figs. IV and V show at a larger scale what might be called a practical range of diameters and capacities taken from the full range shown on Fig. III. On Fig. IV it will be observed that a 20-inch line with ½-inch wall requiring about 280 tons of steel per mile will carry 150 million cubic feet, while a 28-inch diameter pipe with ¼-inch wall would carry the same quantity requiring only 200 tons of steel per mile. This clearly shows that the use of thin wall large diameter pipe effects a considerable saving in steel.

The effect of the ratio of the inlet pressure to the outlet pressure on the weight of steel where rock pressure alone is used may be illustrated by a concrete example. A line is to deliver 100 million cubic feet of gas per day over a length of 100 miles with an outlet pressure of 100 pounds per square inch and has available a rock pressure at the inlet of 600 pounds per square inch. The gas may be carried in the line designed for 600 pounds inlet pressure or the pressure at the inlet may be reduced to somewhat lower pressures resulting in larger diameters of pipe.

Fig. VI shows the effect upon the diameter and weight per mile as the inlet pressure is reduced, step by step, from 600 pounds down to 100 pounds. The diameter of the pipe increases and the weight of the pipe gradually decreases to a point slightly below 200 pounds inlet pressure where the absolute pressure ratio is 1.785, after which the weight increases very rapidly as it approaches 100 pounds. This would indicate that, for a fixed outlet pressure of 100 pounds, the minimum weight of steel per mile is obtained with a pressure ratio slightly below 2. It is evident that where high rock pressures are available it is better to reduce the pressure to effect a saving in steel. The line would have the same capacity even though the rock pressure becomes reduced after years of use of the well and compressors would not be needed until the rock pressure had been reduced to nearly 250 pounds. If the cost of laying the line is also considered for this particular case, the minimum total cost per mile would require the use of a somewhat smaller diameter with thicker wall than that corresponding to the diameter resulting in a minimum weight. This is due to the fact that the cost of laying increases with the diameter of the pipe quite rapidly near the point of minimum weight per mile. However, the most economical inlet pressure is still much below the available rock pressure.

Where rock pressure alone is used, the absolute pressure ratio resulting in a minimum weight of steel per mile may be found mathematically for a given outlet pressure. Using a combination of the formulae for weight of pipe, flow of gas, and operating pressure and differentiating an equation to find the minimum weight, results in an equation showing the relation of the outlet pressure, inlet pressure and stress. It is of interest that about 1.8 ratio exists for pipe with a stress of either 15,000 pounds per square inch or 25,000 pounds per square inch for quite a range of outlet pressures above 100 pounds.

Total Cost of the Line

So far, the conditions resulting in a minimum amount of steel for the pipe and the best absolute pressure ratio where rock pressures only are used have been considered. From Curves III, IV and V it is evident that the minimum amount of steel requires the use of a thin wall large diameter pipe to carry a given quantity of gas. In order to obtain the minimum total cost of a complete line it is necessary to consider not only the cost of the steel but the cost of laying the line, the cost of compressors and the operating and the yearly fixed costs.

EDITOR'S NOTE: *The factors of pipe line cost referred to in the preceding paragraph are treated in the concluding portion of Mr. Kepler's paper, to appear in the December issue.*

GREAT FALLS NOW HEADQUARTERS FOR N.W. STATES UTILITIES

Great Falls, Mont., has been designated as headquarters for the Northwest States Utilities Co., operating subsidiary in Montana and Wyoming districts of the Minnesota Northern Power Co. This decision was made known through an announcement made by R. M. Heskett, vice-president and general manager of the Northwest company, during the annual directors tour of Minnesota Northern officials.

The Great Falls office, of which J. C. Jordan is manager, will have charge of the Malta-Glasgow, Havre, Conrad-Choteau, Lewiston, Mont., and Buffalo-Sheridan, Wyo., properties of the company, as well as any future developments in these territories.

It is anticipated that the office of the company at Great Falls will be enlarged to include the necessary personnel.

WILLIAMS RADIATOR CO. HOST TO SO. COUNTIES SALES MEETING

The commercial department of the Southern Counties Gas Co., held its monthly sales meeting on October 16 at the factory of the Williams Radiator Co. on Cordova St., Los Angeles. Company officials and sales representatives to the number of 75 were present, as well as many of the Williams Radiator Co. staff. An inspection of the factory was conducted during the evening.

SOUTHERN CALIF. GAS CO. FAVORS COOKING SCHOOLS

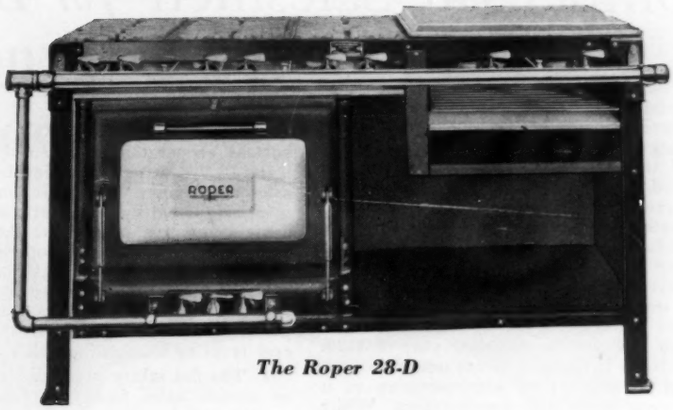
Several cooking schools have been conducted by Southern California Gas Company during the past month. In cooperation with the Tappan Stove Co. a demonstration was held in Lancaster, October 21 to 24, inclusive. Butane service was to begin in Lancaster late in October, this being the first gas ever used in Antelope Valley. Lancaster is the largest community in the valley.

A school was held at Hanford, from October 21 to 23, with Ella Lehr of San Francisco conducting the demonstrations.

In conjunction with the Glendale News-Press another school was staged in Glendale, October 28-31, at the Stepper Auditorium, directed by Florence Austin Chase.

A Leader In Sales

A Leader In Reputation



The Roper 28-D

The Range that Sells itself

The Roper 28-D has established its reputation as a sales leader for the short order and small restaurant trade.

It is popular with the salesman because it is popular with the chef; it is popular with the chef because of its convenience and adaptability. The range has a 3-section open top with 3 standard burners and 3 giant burners, a 2-section griddle top heated by 2 loop burners, toaster and broiler underneath the griddle, heated by the same 2 burners, and a baking oven 22x19x14".

The 28-D can be operated by itself or as part of a battery of two or more units, and one, two or all of the open sections can be converted into closed tops.

The chef is interested in speed and convenience; the owner is interested in operating economy. An outstanding characteristic of every Roper product is economical operation.

ROPER

TRADE MARK REG. U.S. PAT. OFF. REG. IN CANADA

GAS RANGES

GAS FURNACES

Geo. D. Roper Corporation, Rockford, Ill.

C. B. Babcock Co.,
Pacific Coast Branch
135 Bluxome St., San Francisco

Compensate Salesmen *for* Business Development

The sales representative's commission journal contains merely a listing of the various items entering into the salesmen's compensation, these columns each being totaled at the end of the month and the commission not computed on each individual sale, although the representative may easily make individual computations for himself as the sale sheets come through.

Under this schedule 66 territory sales representatives in the property using it were reported to the Government for income tax purposes as receiving an average of $301.33 a month each for the calendar year of 1929.

Plan No. 5 is reported as not nearly so complicated or difficult of administration as it may appear upon first consideration. While it involves more accounting, it is credited as the most important feature (not forgetting trained personnel and excellent morale) and with the greater portion of an outstanding success in achieving load-building and revenue production at faster rates than those budgeted as satisfactory, and at much lower costs than were anticipated.

Plan No. 6

1. Salary of $50 per month.
2. Load-building commissions (revenue bonuses).

Automatic storage water heater	$10.00
Automatic instantaneous water heater	8.00
Gas range	5.00
House-heating furnace or conversion burner (Domestic)	15.00
Radiant fireplace heater	1.00
Gas refrigerator	5.00
New gas service	1.00
House-piping job, per outlet	1.00

(This does not apply to additions to old piping.)

Note: No load-building commissions or revenue bonuses are paid on sales at employees prices or at a discount other than a cash discount or upon replacement of an existing gas appliance except in case of a storage or instantaneous water heater which replaces a side-arm heater.

Plan No. 7

1. Salary of $50 per month.
2. Load-building commissions (or new customer bonuses) applicable only to new customers or additional services for present customers.

Range	$1.00
Tank water heater	1.00
Refrigerator	1.00
Automatic water heater	2.00
Incinerator	1.00
Auxiliary heating	1.00
Central heating	2.00
Minimum for any meter application	1.00

3. Merchandise commission of 10% on all domestic appliances excepting wholesale, apartment houses, major house heating, and refrigeration.

4. Merchandise commission of 5% for closing major house heating or 2½% for assistance on same.

5. Merchandise commission of 10% on refrigeration where sold independently or 5% with assistance of refrigerator man.

Down-payment commissions of 2% of cash-down payments (up to $10 maximum bonus) where cash payment exceeds $25.

COMPENSATION FOR SALES FLOOR OR STORE EMPLOYEES

A majority of member companies appear to favor commission schedules instead of flat salaries as necessary incentives to most alert and effective store salesmanship. Competition should be minimized between the outside and inside sales forces. Better impressions are made upon customers and a tremendously im-

(*Continued from Page 32*)

portant cooperation between the two forces is conserved where both inside and outside salesmen receive their full commissions on sales originated by them but closed by others. Your committee urges that the fullest possible coordination and cooperation between the two classes of salesmen be sought through the elimination, as far as possible, of competition between inside and outside sales people for the customer's order. There are several ways of eliminating this competition:

1. The flat salary plan for either the inside or outside sales force (or for both). Not recommended.

2. Commission protection for a limited (or indefinite) period on sales to prospects originated by members of one sales force, but consummated by members of the other sales force. Examples of such protection are as follows:

The territory salesman can be given the protection of full commission paid him on any sale made by the store salesman within 60 days (or indefinitely) to a prospect for whom the outside man has filed a card indicating previous solicitation.

The store salesman can be be given the protection of full commission paid him on any sale to a customer whom he has interviewed upon the sales floor, and to whom he has sent the outside salesman.

It is vitally important that the territory salesman not annoy his customer by the expression of too great an eagerness to personally sell an appliance which the customer prefers to select upon the sales floor; also that he not waste time he should devote to territory solicitation, in making unnecessary visits to the store for the purpose of securing an order in person. It is equally important that the store salesman not permit an interested visitor to leave the sales floor without he first secures the name and address and then makes every endeavor to bring about the subsequent consummation of the sale at the premises by the outside salesman.

Plan No. 1 below outlined was devised to completely eliminate all competition between territory and store salesmen, and to bring about the utmost cooperation between them.

Plan No. 1

1. Salary of $100 per month (and upwards, depending upon fitness, length of service and other qualifications).

2. Merchandise commission of 1% of all monthly gas appliance sales made by the combined outside and inside sales forces. This 1% of total sales constitutes a pool which is divided monthly among the salesfloor people, being prorated according to each inside salesman's individual percentage of the total points for the month. Each point represents $1 in sales secured personally upon the sales floor, or credited to him as a result of sales made to customers to whom he has shown appliances upon the sales floor, and to whom he has sent the outside salesman who took the orders.

Note: Under this plan each territory salesman receives full commission upon all store sales made upon his territory, and therefore concentrates upon territory solicitation and the sending of people to the sales floor. The store salesman is as greatly interested in sending and helping the outside salesman to close a sale with a customer whose name and address he has secured upon the salesfloor, as he is in taking the order in the store.

Plan No. 2

1. Salary: men, $100 per month; ladies, $75 per month. Short hour, $50 per month (6 hours per day).

2. Merchandise commissions as follows:

Water heaters	4%
Incinerators	3%
Heatrolas	3%
Radiant heaters	3%
Small merchandise	3%
Ranges selling above $50	2%
Ranges selling below $50	1%
Laundry equipment	2%
Gas-fired refrigerators	2%
Time-O-Stats	2%
Hot plates	1%

1% commission is paid if a sales person issues a prospect that results in a completed sale.

Plan No. 3

1. Salary $25 per week.

2. Merchandise commission of 2% of sales based on "delivered only" price.

Note: If salesfloor person closes a sale for a district salesman the sales person will receive one-half of the district salesman's commission.

COMPENSATION FOR NON-SALES DEPARTMENT EMPLOYEES

Your committee calls attention to the great possibilities for increased sales through compensation, prizes, recognition, etc., offered to employees outside the sales department to bring about sales assistance, tips, leads, etc. Under this heading should also be urged the advisability of special campaigns, prices and terms for the purpose of inducing employees themselves to purchase and use gas equipment. C. A. Luther, of The Peoples Gas Light and Coke Company, has furnished information concerning the very effective means for securing the assistance of outside employees in Chicago, through a continuous employees' commission plan as follows:

Plan No. 1

1. Merchandise commission of 2% on "delivery only" price on retail sales, and 1% on wholesale sales.

2. Points on sales basis, the two highest employees being sent to the convention.

Note: Each prospect must be filed with the Sales Department in duplicate. The prospect is filed according to the Sales Division to which prospect is sent, then filed in the Division, the priority of the filing governing the awarding of commission or points. Prospects are filed through organization channels, and a weekly report shows the number of sales, prospects, etc., by departments. This stimulates friendly rivalry.

Plan No. 2

1. Merchandise commission of 4% is paid to any employee who closes a sale, bringing in a signed order with cash or down payment.

Plan No. 3

The Employee Productive Lead Compensation:

Leads, Retail	
Central heating plant or conversion burner	$5.00
Gas refrigerator (retail)	5.00
Gas refrigerator with range	5.00
Automatic storage water heater	5.00
Circulating tank water heater	2.00
Jarvis Thermoflash (conversion)	2.00
Incinerator	2.00
Laundry dryer	1.00
Ironer	1.00
Oven heat regulated range	.50
Industrial or hotel range, per unit	2.00
Space heater	.50
Gas steam radiator	1.00

Every Medium-Sized Home Can Afford This Barber Conversion Gas Burner

List Price
$112.50
No. 324-B
Barber Automatic Burner

THIS new line of BARBER Automatic Conversion Gas Burners, with list prices from $72.50 up, creates an unusual opportunity for gas companies to convert the great middle class market to the use of gas for home heating. The "load" building possibilities are immense.

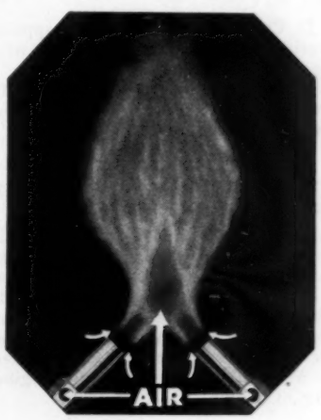
These people are eager to get away from the slavery of shoveling coal and hauling ashes. They have been waiting for an automatic conversion burner that would assure them an efficiency and economy favorably comparable with the custom-made gas-fired heating plant.

BARBER Automatic Gas Burners are the answer. With the BARBER Patented Jet Burner producing a flame hotter than ordinary mixer-type burners and with this flame applied directly to the heating surfaces at the proper level of furnace or boiler, the result is an effectively heated home and moderate gas bills.

Now is the time to cash in on this opportunity. Write for our new sales book, "More Gas" which gives you the complete technical and selling story. Our new discounts are attractive.

BARBER Burners are quickly and easily installed in any furnace or boiler, in exactly the size and shape needed for efficient results.

Note in the illustration below how the proper amount of air is fed to the jets and flames especially through the vacuum formed where the twin-flames meet. This means perfect combustion which only the BARBER principle makes possible.



BARBER *Automatic* JET GAS BURNERS

The Barber Gas Burner Co.

3702 SUPERIOR AVENUE **CLEVELAND, O.**

FORMERLY THE CLEVELAND GAS BURNER & APPLIANCE CO.

Conclusions and Recommendations

Summing up, your committee submits the following recommendations, several of which are repetitions from the splendid reports of the Committees of 1929 and 1928:

1. That more consideration be given to the fundamental principles of Salesmen's Compensation, and that no compensation plan be adopted or continued which is not the result of a most careful study and application of these principles.

2. That the sale of gas—and not the sale of merchandise—is the primary function of gas salesmen, and that therefore all compensation paid should be based upon the constructive and scientific development of the business through the encouragement of the sales of those gas-consuming appliances which most largely increase the sale of gas and which produce the best load factors.

3. That salesmen in the gas industry are not paid enough, and that a change which provides higher compensation for effective efforts is necessary in order that a superior type of salesman be attracted; also that it be realized that cheap men of inferior capacity cannot produce adequate sales of gas at satisfactory selling costs.

4. That while total sales costs must fall within permissible limits the selling expense of our gas companies is really far below that of other competitive industries, whereas we need a much higher type of salesman.

5. That a commission plan based upon the fundamental principles of salesmen's compensation be used for store employees on the salesfloor; also that competition between store salespeople and territory salesmen be minimized.

6. That sales compensation for non-sales-department employees be used to secure tips, leads and other assistance.

7. That additional rewards offered in contests or for meritorious achievements be utilized to stimulate extraordinary effort on the part of territory salesmen, store salespeople and non-sales-department employees.

Enriching Oil Gas *with* Butane

(*Continued from Page 28*)

amounted to 4 cents per thousand cu.ft.

The high cost of butane at the refinery together with the exorbitant freight rate conditions, is a problem which probably in the future will be somewhat remedied, and it is expected that before the coming winter season, when for four months we will be on this enriching program, prices and freight rates will be materially reduced.

It was found that in making lean gas, the generating capacity of the plant was increased 30 per cent. Considering relative investments of butane installation as compared with additional oil gas generating capacity, which would only be used a small portion of the year, the addition of 4 cents per thousand cu. ft. is more than compensated for by interest and depreciation on added oil gas generating equipment.

As stated above, the writer believes that the present butane market is unequitable, butane being strictly a by-product and its chief established market to date being its sale in small tankage for individual home consumption. It should assume the character of a gas generating and gas enriching commodity and should be sold on such a basis. Where one gallon can be disposed of in small tankage, 500 gallons can be sold to gas companies for gas generating purposes.

Summing up, the writer does not hesitate to say that where present generating capacity is over-taxed a solution in the use of butane can be worked out. The use of butane for gas making purposes is ideal. Its storage is cheap and safe, when energy content is considered. Its utilization offers no complications and the only question is an equitable price to the utility.

COMPLETE NEW LINE TO MUSKOGEE AND OTHER OKLAHOMA CITIES

Southwestern Natural Gas Co. has completed a 112-mile transmission line from Quinton Field to Muskogee, Sapulpa and Boynton, and gas was turned into the mains of the Muskogee Natural Gas Co., distribution unit, on October 2.

W. J. Cunningham has been appointed vice-president and general manager of the Muskogee company, taking the place left vacant by the resignation of Howard Mills. Both companies are subsidiary to the Appalachian Gas Corp.

BEAUMONT TO HEAD UTILITIES SECTION OF SAFETY COUNCIL

E. S. Beaumont of the Peoples Gas Light and Coke Co., Chicago, Ill., was named general chairman of the Public Utilities Section of the National Safety Council, at the 19th Annual Safety Congress held at Pittsburgh last month. The vice-chairman in charge of gas interests to serve for the coming year is Gordon Wilson, Management and Engineering Corp., Chicago, Ill.

RED DEER, ALBERTA, IN DEAL FOR NATURAL GAS SERVICE

The board of trade of Red Deer, Alberta, is considering giving a natural gas franchise to the Canadian Western Natural Gas, Light, Heat & Power Co., Calgary, Alberta. The company recently completed an extension to serve the residential section of Taber, Alberta, with natural gas.

E. B. TODD TO HEAD SALES ACTIVITIES IN THREE TOWNS

E. B. Todd will have charge of gas new business activities in the territories of Delhi, Lake Providence, and Tallulah, La., for the Louisiana Power & Light Co. headquartered at Monroe La. Mr. Todd has been with the company for the past three years and prior to taking over his new duties, has been cashier of the West Monroe office.

GRANT CITY, MO., FRANCHISE TO MARYVILLE ELECT. L. & P. CO.

Maryville Electric Light & Power Co. has been granted a 20-year franchise for the service of gas in Grant City, Mo.

TEXAS PUBLIC SERVICE BUYS FOUR GAS SYSTEMS

Texas Public Service Co., of Austin, Texas, a subsidiary of People's Light and Power Corp., has contracted to purchase the gas distribution properties now serving the city of San Angelo, Texas, and the near-by towns of Rowena, Ballinger and Miles. The total consumption of natural gas in these towns last year was approximately 1,600,000,000 cubic feet.

The territory supplied by the system represents a combined population of about 35,000. In addition to domestic consumers, natural gas is also being served for electric generating purposes to West Texas Utilities Co.

CHANGE IN COMPANY NAME AND PERSONNEL ANNOUNCED

Announcement is made by C. B. Shaklee, general manager of the Western Gas and Utilities Corp., of Salina, Kansas, that the name of the subsidiary company operating in the state of Washington has been changed to the Western Gas Company of Washington. The towns now being served by the company in Washington are Longview and Kelso, and a plant is being constructed at Bremerton. The manager of the district is L. M. Longan, and assisting him are Joe Dunbar, commercial manager, and H. D. Ridgway as purchasing agent.

PUBLIC SERVICE CO. OF COLO. ASKS FOR BRIGHTON PERMIT

The Public Service Company of Colorado, headquartered at Denver, has made application for a franchise to serve Brighton, Colo., with natural gas. The fuel will be brought from the Colorado-Wyoming Gas Co. line running north from Denver, the connection to be made just south of Lafayette. It is planned to serve Fort Lupton also from this line. The distribution system at Brighton will cost in the neighborhood of $50,000.

PIPE LINE MAP SHOWN BY GAS SERVICE CO. AT STATE FAIR

Gas Service Co., of Kansas City, Mo., installed an effective booth at the Kansas State Fair, held recently. A map 12 feet long and 9 feet wide was prepared by the company, showing the distribution system, towns served, compressor stations, towns served wholesale, and sources of the supply of the fuel.

BRISTOL COMPANY'S NEW LINE DESCRIBED IN BROCHURE

The Bristol Company's catalog 4000, featuring the company's new air operated controller equipment, has recently been brought from the press The bulletin is fully illustrated, and descriptive of the new line, and may be obtained by writing to the company at Waterbury, Conn.

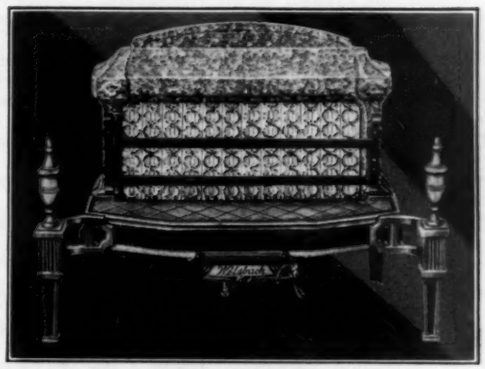
MONETT, MO. CITY SCHOOLS BEING PIPED FOR "NATURAL"

Contract has been made with the Ozark Distributing Co., Gas Service Company subsidiary, for the supplying of the city schools of Monett, Mo., with natural gas. All the buildings are now being piped with the new fuel.

ELECTION TO DECIDE UPON GAS FRANCHISE AT KEYSTONE

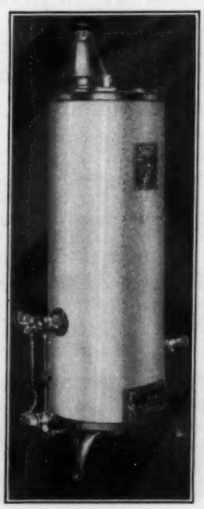
The town board of Keystone, Okla., has authorized calling an election to vote on granting a gas franchise to the Oklahoma Power & Water Co., of Sand Springs.

Time proved value is of Key Importance in these days of Careful Buying



THESE are days of careful buying. Close scrutiny of value is the rule . . . And the name Welsbach, backed by 40 years of earned leadership in the gas appliance field, is recognized by Commercial Managers more fully than ever before as a definite factor in making sales... **Welsbach Radiant Heaters** are outstanding because of their original design and fine finish—yet are moderately priced . . . Welsbach quality is revealed in every detail of their construction.

Welsbach Water Heaters have gained their leadership through their efficient performance (and favorable prices). In fact there is not a single detail of any Welsbach appliance that will not bear close examination by today's buyers. When Welsbach gas appliances are featured, profitable sales are sure to result.



Member of American Gas Association

WELSBACH COMPANY

GLOUCESTER CITY, N. J.

Offices in Principal Cities

50 Hawthorne Street San Francicco

Pipe Line Right *of* Way Procedure

(*Continued from Page 33*)

with the owner. There are still other obstacles to overcome in the way of title defects, undistributed estates, minor heirs, and many other technical encumbrances requiring court actions to clear before the owners, even if willing to do so, can deliver a satisfactory grant.

I have pointed out some of the detail involved in obtaining rights of way to enlighten those who wonder why construction does not start the day after a job is authorized, or why the construction crews are required to skip this parcel or that parcel until a later date, or why they are sometimes held up for short periods pending the completion of a transaction.

In the undertaking just completed it is a source of satisfaction and, I believe, a credit to the men who handled the individual transactions, that rights of way for the entire system of lines were acquired without a single "unfriendly" condemnation proceeding. I qualify by using the word "unfriendly," as in a few instances suits were filed and later dismissed when an amicable settlement was reached, and in other cases, due to condition of title, where grants were obtained through court action following an agreement on terms with the property owners.

Right-of-way Costs

There are numerous theories as to the method of obtaining rights of way and the consideration to be paid therefor. One that sounds very good and is sometimes used as a measure in the purchase of real estate is "that value which is agreed to between a willing buyer and a willing seller." This theory may be applicable in the purchase of land where there are several parcels from which one is to be selected, but hardly applies to rights of way where a definite location has been selected and the grants must run continuous from end to end.

In days gone by the common practice in acquiring a right of way some miles in length was to look at the over-all cost, acquiring as many grants as could be obtained at the lowest possible cost, then another group at the next higher asking price, and so on until the last ones were finally settled at very high rates, the average, however, being within the original estimate. The result of this method of obtaining rights of way was to encourage the land owners to hold out as long as possible, knowing that by so doing the company would eventually raise its offering price and they would receive a higher rate of compensation for the same privilege that a neighbor had granted for a smaller sum. It does not require much imagination to appreciate the thoughts of the property owner who settled on the basis of the first offer made when his neighbor advised him what he had obtained by holding out. A further result of this method was the ever-increasing price and difficulty of obtaining the grants.

As time has changed other things so has it changed the policy of obtaining rights of way. Under the present practice an effort is made, prior to the time of contacting the property owners, to establish a fair rate of compensation with due consideration to the value of the land, the manner in which it is to be crossed, damage that will result by reason of the construction and future operations, and any restrictions prohibiting the use of the right of way strip by the owners. The rate so established is made sufficiently liberal so that the property owners are amply compensated for the encumbrance placed on their property and in most instances they are willing to recognize that the utility is offering a fair settlement. Deviations from this established rate of compensation are made only when it is found that the value of the right has been underestimated and in such cases it is the practice to make upward adjustments with owners who have already signed if the character of their land is the same or similar conditions exist.

The success or failure of the utility's representative in obtaining the desired grant is dependent, in a great measure, upon his ability to gain the confidence of the property owner and convince him of the company's desire to deal fairly and equitably. Every company agent who contacts the public, whether he is the surveyor, right of way agent, construction representative, claims adjuster or salesman, is instructed to give due consideration to the rights of property owners in any transaction.

Meeting Opposition

While fairness and the most exacting consideration of the rights of owners must govern every transaction, and the majority of owners are willing to deal on that basis, there are, nevertheless, a certain percentage who are unreasonable in their demands. In many instances we have found that, as the result of our policy of fair dealing, owners who were satisfied with our settlements have used their good offices to assist in obtaining the consent of the others. Occasionally owners have grouped together for the sole purpose of exacting a rate of compensation greater than the value of the property would warrant. Such situations must be met with tact, yet at the same time the utility cannot afford to allow itself to be victimized through its desire to complete the line with a minimum of delay. In such instances a change of location, a slight modification of the terms, or the exercise of its legal rights usually results in an equitable adjustment in which all parties are satisfied.

As a general rule the owner who raises various objections to the manner in which the line is to be located, the probable damage that might result, the terms and conditions of the contract, etc., usually does so in order to try and justify, in his own mind, a higher rate of compensation. If confronted with the possibility that the line will be relocated off of his property with a consequent loss of the compensation to be paid, he usually changes his opinion and is agreeable to accepting the rate which is offered.

An essential detail that helps to win and hold the confidence of property owners is cooperation from the construction forces in keeping the damage to a minimum and in restoring the property to its normal condition as soon as possible after the construction work is completed; also the adjustment of damage claims with the least delay.

Our right of way contract is simple in form and follows, in general, those used by most companies laying pipe lines. It has been generally accepted by attorneys throughout the state as fair both to the company and the property owners.

In conclusion we might say that the soundness of the present policy and methods of securing rights of way is best indicated by the results obtained. In the broad field in which we operate we are finding it necessary to approach the same parties not only once but many times for grants of different nature. The results accomplished on the gas transmission system is indicative of how we have been able to deal successfully with owners, from a number of whom we had previously acquired one or more rights of way.

GROBLE REGULATORS & GOVERNORS

Complete Line of Regulators for

Natural, Manufactured, Butane and Propane Gas

Pacific Coast Representative,

T. G. ARROWSMITH COMPANY,

661 Howard Street San Francisco, Calif.

Phone Garfield 8419

GROBLE GAS REGULATOR COMPANY

Office and Factory: Anderson, Indiana

ORDER PLACED WITH MUELLER FOR SHELL PLANT EQUIPMENT

For use in its new nitrogen fixation plant at Sheel Point, near Pittsburg, Calif., the Shell Chemical Co. has recently placed an order with B. W. Mueller, Pacific Coast representative of the Western Gas Construction Co., for 26 Western Gas double disc gate valves, ranging in size from 12 to 36 inches.

Work on this plant is proceeding rapidly, and it is anticipated that construction will be finished at an early date.

VEEDER SUPPLY & DEVELOPMENT TO SERVE McCUNE, KAN.

The Veeder Supply & Development Co., of St. Paul and Cherryvale, Kan., has secured the franchise for the service of natural gas at McCune, Kan.

. . . . Humphrey Gas Unit Heaters Provide Unequaled Advantages In Industrial Heating

North Car Barn, Wisconsin Public Service Corporation, Green Bay, Wisconsin

In addition to being the ideal method of heating industrial plants when the comfort and productive capacity of workmen are a prime factor, gas is especially desirable in such instances as that pictured above . . . This Humphrey Gas Unit Heater installation was made in the North car barn of the Wisconsin Public Service Corporation at Green Bay, Wisconsin. Eight units are installed in this car barn, which has a 24 ft. ceiling and a floor space 47' x 198'. The units proved to be adequate for heating the building, even though the temperature frequently dropped to 20 degrees below zero. Eliminating licensed firemen, boilers, coal and ashes, Humphrey Gas Unit Heaters provide the most modern, flexible and adaptable form of efficient heating for every type of industry.

GENERAL GAS LIGHT CO.
C. B. BABCOCK, Pac. Coast Mgr.
135 Bluxome St., San Francisco

The Humphrey Gas UNIT HEATER

Telling the Story of Gas in Industry

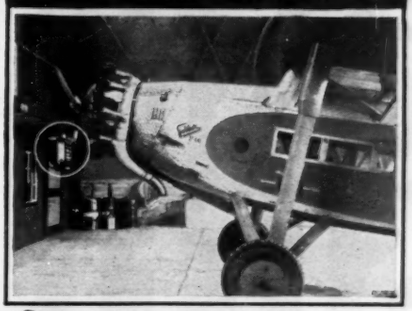
Industrial magazines, trade publications and business papers are now carrying a new story of great significance to the gas industry.

The newest and most widely adaptable use for this modern, universal fuel is being pointed out to millions of potential users. First in the field and foremost in quality, the Humphrey Gas Unit Heater has won widespread acceptance over the entire country.

The barriers of solid fuel, with their old style inflexible, wasteful heating plants are yielding to the attacks of the new era and its significant keynote, "modernize with gas."

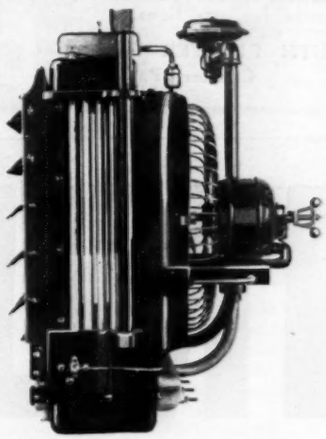
General Gas Light Co.
Kalamazoo, Mich.
C. B. Babcock
Pacific Coast Manager
135 Bluxome St.
San Francisco

The Humphrey Gas UNIT HEATER



Interior view of airplane hanger at Calgary, Alberta, Canada, which is heated with Humphrey Gas Unit Heaters. Forty degrees below zero is a common temperature during the winter months in Calgary.

. . . For Temperamental Temperatures



You can't control extreme temperature ranges from a central heating plant with any degree of certainty. You *can* control them efficiently and economically by using Humphrey Gas Unit Heaters. These modern heating units are spotted throughout the building at scientifically determined intervals. They burn gas—the most flexible, convenient and economical of all fuels for the purpose. They give you instant heat, where and when you want it. They decrease your heating costs and increase the efficiency of your workmen by keeping them comfortable at their tasks. May we send you a catalog?

GENERAL GAS LIGHT CO.
C. B. BABCOCK, Pac. Coast Mgr.
135 Bluxome St., San Francisco

SOUTH CHESTER STEEL PIPE

Excels for Gas Service

The unusual care given to accuracy of diameter and welding qualities, makes Chester Pipe a favorite for gas lines.

SOUTH CHESTER TUBE CO.
Chester, Pa.

THE BABY DIGGER

The Ideal Modern Way To Dig Gas Trench!

Cleveland Baby Diggers are unequalled for downright usability and trenching satisfaction. Compact — transportable — economical. Tough — fast — dependable. Precision built of finest materials. A wheel type trencher on full crawlers. You'll find Cleveland Trencher pioneering the features that count. Write for particulars.

THE CLEVELAND TRENCHER COMPANY
"Pioneers of the Small Trencher"
20100 St. Clair Ave.
Cleveland, Ohio, U. S. A.
Distributed By
Edward R. Bacon Co., San Francisco, Cal.
Frank T. Hickey Co., Los Angeles, Cal.

IMUNOL

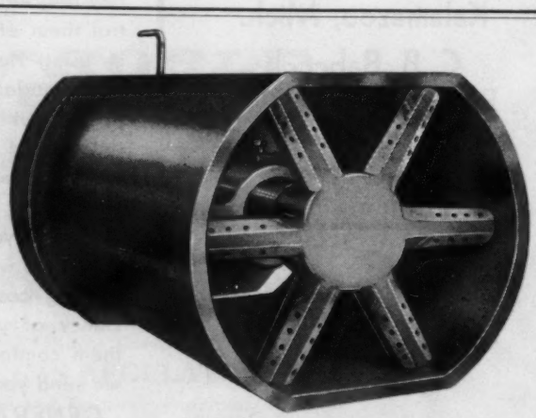
Reg. U. S. Pat. Office
U. S. and Foreign Patents Granted

GAS BURNERS
For
ALL INDUSTRIAL PURPOSES

JOHN ZINK CO.
Oklahoma Natural Gas Bldg.
Phone 4-9838
TULSA, OKLAHOMA

★

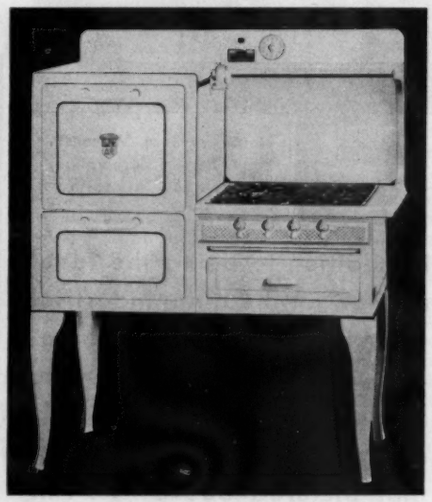
Flameless Burners
Flame Burners
Short Flame Burners



New Device Turns *on* Gas *in* Range *at* Set Hour

THE A-B Stove Co., Battle Creek, Mich., presents to the gas industry a fully automatic gas range. This new product has a number of new features.

The automatic control uses a single pilot, on the cooking top, and there is no heat in the oven until the clock turns on the gas. The new range is equipped with a safety pilot valve which shuts off the gas in case the pilot flame should go out. The automatic control does not interfere with the manual operation of the range. It is necessary only to turn the clock valve, and the range works as though the automatic control were not attached.



This new product is furnished in three full porcelain finishes with the A-B "Super-insulated" oven, the dual burner cooking top, and the "Sani-Tray"—the removable clean-out tray.

CHANGES IN OKLAHOMA NATURAL PERSONNEL ANNOUNCED

Several changes in personnel in the organization of the Oklahoma Natural Gas Corporation, Tulsa, Okla., have been announced recently. Wm. P. Canavan, of Oklahoma City, has been appointed a vice-president of the company in executive charge of western Oklahoma properties, including Oklahoma City, Guthrie, Enid, Shawnee, Ardmore, Norman and El Reno. J. W. Duvall, of Oklahoma City, who has had charge of industrial sales for the company in the western part of the state, has been appointed superintendent of the industrial sales department for the entire system, to succeed R. H. Ulrich, of Tulsa, who has left Oklahoma Natural to join the operating department of the Southern Natural Gas Corp., headquartered at Birmingham, Ala.

ALINE, CARMEN, DACOMA, IN LINE FOR NATURAL GAS SERVICE

Aline, Carmen and Dacoma, Okla., are expected to be supplied with natural gas soon by the Winchester Oil & Gas Co., franchises having been granted to the company.

McGREW GETS GAS FRANCHISE AT HARDIN, MO.

Hardin, Mo., has granted a natural gas franchise to E. J. McGrew and associates of Lexington.

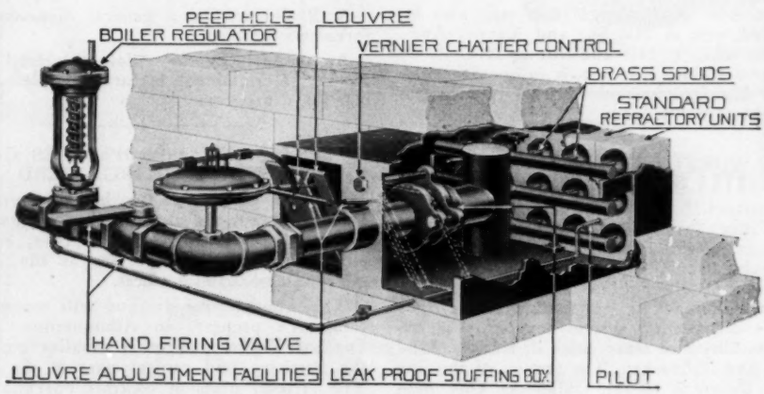
The Truth About Gas Burners

Is Found In Results Obtained

A test was made in the Republic National Bank Building, Dallas, last February simultaneously between a King Synchronous Gas Burner in one boiler and a burner costing six times as much in another boiler of the same capacity—equal temperatures inside and outside of building—with results as follows:

	CO^2 OBTAINED WITHOUT CO	STACK TEMPERATURES	GAS SAVING
King Synchronous	11.0	350° F.	200 cu. ft. per hr.
High priced burner	9.2	450° F.	

KING'S replaced the originally installed burner and has also been specified for the 18 story annex now being added to the Republic National Bank's main building shown at right.



The famous chain of Baker Hotels also have been equipped with KING SYNCHRONOUS GAS BURNERS, one by one, with a resulting MINIMUM ANNUAL saving of 100% on the investment in each instance—*over several types of replaced burners.*

Among other satisfied users of KING SYNCHRONOUS GAS BURNERS are:

U. S. Government
Montgomery Ward & Co.
S. H. Kress & Co.
Publix Theatres Corp.

Republic National Bank Building, Dallas

The mechanical control that makes King Synchronous Gas Burners instantly adaptable to any fire box condition is patented and found in no other burner. Elimination of combustion impediments with KING CONTROL is like tuning a radio receiver—SYNCHRONIZATION of combustion factors is obtained . . . doing away with the element of guess.

King Synchronized Control of varied and variable combustion factors eliminates service expense. . . . Troubles arising from fluttering—vibration—improper air mixture—varying gas pressure and B. T. U. content—stack and draft variations—wind deflection, etc., positively tuned out with radio-like selectivity. . . . Simple in control and adjustment. Supplied for either automatic or normal control.

Write For Information and Liberal Dealer Franchise

KING BURNER COMPANY Inc.

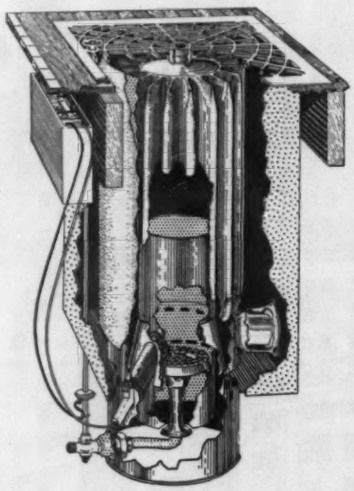
BURT BUILDING – DALLAS, TEXAS

Electrogas

"It's Matchless"

Now Made in Five Sizes to Meet All Requirements.

20,000 to 46,500 B.t.u. Ratings.



Featuring

Positive Electric Ignition
Efficient Heating Element
New Natural Gas Burner
Safety Vent Outlet
Insulated Inside Jacket
Open Base Construction

Proven Economy and Durability through many years of service.

Electrogas Furnace Co.
Rialto Building, San Francisco

Electrogas

"It's Matchless"

THE illustration shows the A. O. Smith Corp. pipe storage and loading yards, at Milwaukee, Wis., with pipe destined for some of the large pipe lines now in construction. There are 225 miles of pipe in the storage and on the cars, ready for shipment to the Missouri Valley Gas Co., the Southern California Gas Co., the Electric Bond and Share Co. (Texas Construction Co.), The Southern Counties Gas Co., the Phillips Petroleum Co., the Southern Natural Gas Co., the Continental Construction Co., and the Columbia Gas and Electric Co. The A. O. Smith Corp. pipe storage, when filled to capacity, holds 77,000,000 pounds of steel pipe—450 miles in the 10-inch size. The storage is in steel crates, each of which contains one carload, regardless of size. The entire crate is lifted by a 50-ton crane, making loading of the cars a simple matter. Shipments are made at the rate of 800 to 900 cars per week. On September 24 a record run of 33½ miles of pipe was made.

CAPITAL GAS AND ELECTRIC CO. TO EXTEND TOPEKA SYSTEM

The Capital Gas and Electric Co. of Topeka, Kan., a Gas Service Co. subsidiary, plans to start soon on a construction program designed to provide better service for the south and west districts of Topeka. About $180,000 is to be expended on the work, which will be completed January 1, according to George J. Swan, general manager of the company.

Two new district regulators will also be installed, one at 21st St., and Kansas Ave., and the other at 21st and Strong Ave.

A new 16-inch line is now in operation between Big Springs and Topeka, replacing a 12-inch main line.

DILWORTH-WICHITA UNIT FOR CITIES SERVICE, COMPLETED

Construction of the 32-mile extension of the Cities Service Gas Company's 20-inch gas transmission line from Dilworth, Okla., to a point near Wichita, Kan., was completed early in October. This extension connects the Oklahoma City gas field with the company's distribution system serving Wichita, Kansas City and other cities in Kansas, Missouri and Nebraska. The section of the line from Dilworth to the Oklahoma City field was completed earlier this year. The new compressor station on this line now under construction near Blackwell includes five units or a total of 5,000 h.p.

JOHNSTOWN TO BE SERVED BY PUBLIC SERV. CO. OF COLO.

Johnstown, Colo., recently voted a franchise to Public Service Company of Colorado headquartered at Denver, for supplying natural gas over a 20-year period. The Great Western Sugar Co., near Johnstown, has been operating with natural gas for several months, using the Texas fuel principally to fire equipment under the kilns in which molasses is de-sugarized by barium process.

FOREMEN AND STOREKEEPERS OF LONE STAR DISCUSS PROBLEMS

Objectives and problems of storekeepers and foremen of the Lone Star Gas Company were submitted to discussion at the eighth semi-annual General Foremen's meeting held in the B.T.U. club rooms of the company's Dallas building, October 24. A. W. Breeland was in charge of the meeting.

Speakers and their subjects were: "Foremen's Meetings and Their Objective," by J. R. Jarvis; "Problems of the Present Day Scout," by G. A. Plummer; "Moulding and Maintaining Favorable Public Opinion," by Willard C. Wiegel; "Every Foreman a Purchasing Agent," by B. R. Newbery; and "The Outlook in the Gas Industry," by Chester L. May.

B. R. Rogers led a general discussion of foremen's problems.

A luncheon at the Adolphus Hotel and special entertainment features completed the meeting's program.

NEW MEXICO PROPERTIES OF SO. UNION REORGANIZED

Southern Union Gas Co., headquartered at Dallas, Texas, has announced a reorganization of its New Mexico properties, and is establishing sub-headquarters at the Albuquerque and Artesia offices.

The Albuquerque division will control the company's property in Albuquerque, Santa Fe, Las Vegas, and other smaller cities in the northern and central part of the state. The Artesia division controls operations in Artesia, Hagerman, Carlsbad, Lovington, Clovis, Portales, Tucumcari and smaller companies in southeastern New Mexico and Texas. Operations in the territories in Texas, Arkansas, Louisiana and Mississippi will be under the direction of the Dallas office.

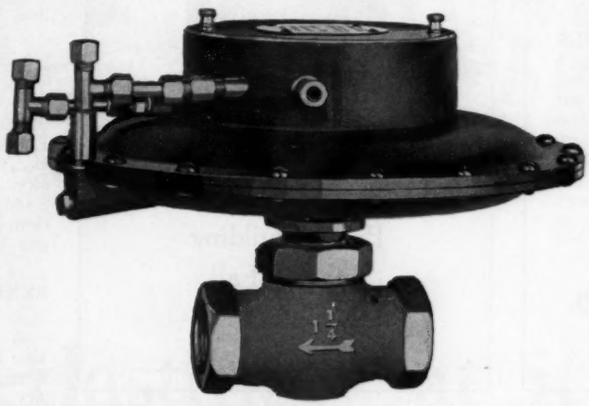
NEW WELL TO AUGMENT SUPPLY AT MEDICINE HAT, ALBERTA

W. J. Perry, Medicine Hat, Alberta, has been given a contract by the city's gas committee, to drill another municipal gas well. The committee has placed an order for the pipe. The drilling of this well is necessitated to prevent a shortage of natural gas in the city such as was suffered last winter.

FRANCIS I. DU PONT DIRECTOR OF MO.-KAN. P. L. CO.

Francis I. du Pont was recently elected a director of Missouri-Kansas Pipe Line Co. at a meeting of the board held in Chicago in October.

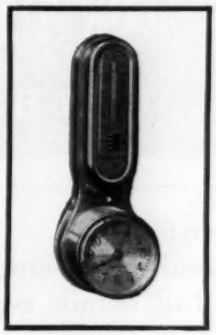
COMPLETE CONTROL



TIME-O-STAT'S *No. 610 Electric Diaphragm Gas Valve*

The Dependable Diaphragm Control System

THE combination of a TIME-O-STAT No. 610 Electric Diaphragm Gas Valve, Room Thermostat and gas type Limit Control provides a complete and reliable control system for gas-fired equipment.



Ruggedly constructed the No. 610 Gas Valve operates from gas pressure built up under the leather diaphragm. Special features of the valve include a gas-tight seat, snap opening valve and the ability to operate on low pressure. Should electric power fail it can be operated manually with complete boiler protection from the gas type Limit Control.

Separate 20-volt transformer furnished for simple low cost installation. Made in full range of sizes. Can be used with the TIME-O-STAT Steam Throttling Valve. For 110-Volt 60-Cycle AC—other models for different cycles and voltages.

BRANCH OFFICES
NEW YORK
BOSTON
CHICAGO
EXPORT DEPARTMENT
NEW YORK

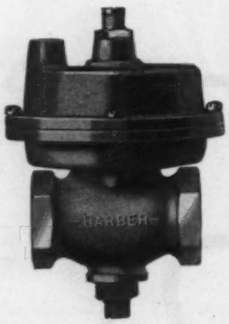
TIME-O-STAT CONTROLS COMPANY
ELKHART, INDIANA

EXCLUSIVE DISTRIBUTORS
IN ALL PRINCIPAL CITIES
OF THE UNITED STATES

CANADIAN DISTRIBUTORS
TORONTO AND MONTREAL

Manufacturers of Automatic Controls for Oil Burners, Gas Burners, Coal Burners, Electrical Refrigerators, Furnace Fans, Mechanical Stokers, Industrial Ovens, Ice Machines, Unit Heaters . . . also of Sign Flashers, Mercury Switches, Electric Heaters, Corrugated Metal Bellows

These BARBER Regulators are set for 3½ ounce gas pressure —the recommendation of the A. G. A.



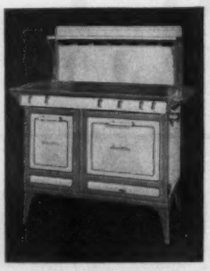
Making Gas Meters Popular

That's a tough job, but the BARBER Gas Pressure Regulator will help a lot. It's an exceptionally accurate, efficient and dependable device, made with bronze valve body and brass working parts—a really precision instrument. It makes for more satisfactory and safer operation of gas appliances, preventing waste of gas. Your customer uses only what gas he needs; knowing that, he pays the bill more cheerfully.

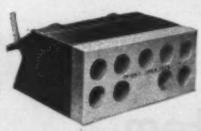
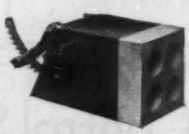
THE BARBER GAS BURNER CO.
3702-04 Superior Ave.
Cleveland, Ohio

Smoothtop
GAS RANGE

"Captures the flavor . . . frees the Cook"



Send for details of new Profit Building Special Fall Campaigns

Mettler Entrained Combustion Gas Burners
FOR ALL Purposes, Kinds of gas, Pressures
406 S. Main St. **LEE B. METTLER. CO.** Los Angeles Cal.

Gentlemen:
Kindly send me a sample can and full details regarding A-B Vit

The New Porcelain Enamel Cleaner

Name.....
Company.....
Address.....

No obligation, of course
Clip and mail today to

A-B STOVE CO., Battle Creek, Mich.

THREE MORE TOWNS BEING SERVED FROM SACRAMENTO EXTENSION

Riverbank and Oakdale, and Ripon, Calif., are now being served by Pacific Gas and Electric Co., of San Francisco, from an extension of the company's line to Sacramento. The extension leaves the main line of the Standard Pacific Pipe Line Co., at Vernalis Junction, and a second extension takes service to the communities mentioned, and also serves Modesto and Salida.

BOWDERN GETS TWO NEBRASKA NATURAL GAS PERMITS

Thomas F. Bowdern is carrying on franchising activity in Missouri cities along the route of the Missouri-Kansas Pipe Line Company's major carrier from the Texas Panhandle to metropolitan centers in Missouri, Illinois and Indiana.

A franchise was granted during the last week in September at Houstonia and Green Ridge, both near the route of the main line.

LINE COMPLETED TO GLASS CO. WAREHOUSE IN EL PASO

A 4-inch low pressure line has been completed by the Texas Cities Gas Co., in East El Paso to serve the Pittsburg Plate Glass Co. warehouse which is being built in that city. The warehouse, with approximately 2,400 square feet of equivalent steam radiation installed, will be heated with industrial gas heaters of the unit fan type.

RENEWAL FRANCHISE GRANTED TO GREELEY GAS & FUEL CO.

A renewal franchise, covering 20 years, has been granted the Greeley Gas & Fuel Company, National Gas & Electric subsidiary, of Greeley, Colo. This town, under arrangements with the Colorado-Wyoming Gas Co., is now supplied with gas brought from the Amarillo field through the major carrier of the Colorado Interstate Gas Co.

GAS DISTRIBUTION SYSTEM AT SPIRO, OKLA., UNDER WAY

A new natural gas distribution system is being constructed at Spiro, Okla. by the Le-Flore County Gas & Electric Co. The company has planned a new gas line from fields near Red Oak, Okla., which will eventually furnish the supply for Spiro. Temporarily however the Spiro distributing system will be connected with gas wells near that town.

TERRITORIAL SUPERVISOR NAMED FOR WICHITA GAS CO.

C. E. Dotson has been named supervisor of territorial assistants for the new business department of the Wichita Gas Co., Wichita, Kan., and William E. Smith has been added to the force as territory representative, going there from a similar position with the Fort Worth Gas Co., Fort Worth, Texas.

REMODEL AND ENLARGE OFFICES OF WICHITA GAS CO.

The offices of the Wichita Gas Co., Wichita, Kan. have been remodeled, and the company has acquired more space in the building for expansion of the office and sales departments.

MIDWEST NATURAL IN NEBRASKA FRANCHISING ACTIVITY

The Midwest Natural Gas Co. represented by Mr. Appling of Lincoln, and Mr. Raines of Fremont, has applied for the natural gas franchise in Hooper, Neb.

Landlords!
keep tenants happy with heat — at a finger's touch
Avoid this sign
FOR RENT
Natural Gas safe, cleaner, more convenient Costs less to use
PACIFIC GAS AND ELECTRIC COMPANY
P·G·and E·
Visit that COLD and DRAFTY house?
— it's nice and warm here!
People accustomed to properly heated homes avoid hovering around an uncertain fireplace.
HEAT at a finger's touch with Natural Gas — it costs less to use
PACIFIC GAS AND ELECTRIC COMPANY
P·G·and E·

Actual size of these November advertisements— 5 col. x 16 in.

Everlastingly at it!!

The Pacific Gas and Electric Company is advertising gas-heating appliances—helping increase your sales without cost to you.

In each advertisement, prospects are urged to see the gas-heating appliances on display at their dealer's store.

One way to cash-in on the P. G. and E. advertising is to follow-up each advertisement with your own window display. Show one or more of the heating appliances illustrated in the advertisements which appear in your local newspapers.

Then, when new prospects shop, a window display will attract them—to your store if you are displaying gas-heating appliances.

* * * *

Advertisements like those reproduced above are creating new prospects every day in the year. That is proved by the rapidly increasing sales by dealers who tie-in their sales program with this Company's advertising.

PACIFIC GAS AND ELECTRIC COMPANY

P·G·and E·

Owned · Operated · Managed

by Californians

Ready for you!

JOHNSON
Gas-Heating Unit

Another highly-perfected JOHNSON product

For converting a hot air, hot water, or steam heating plant into an automatic gas-burning plant, the Johnson Unit is a proved success! Exhaustive experiments and tests made under a vast variety of installations, provided the means of perfecting this famous-made unit. The name Johnson is immediately suggestive of notable accomplishments in the manufacture of gas appliances. This Johnson Gas Heating Unit bears the full mark of Johnson skill and experience.

The increasing market for gas-heating units presents genuine load-building possibilities. The Johnson Unit will adequately meet the needs of this active market. It is a dependable, substantial, and economical unit which is more completely described in a folder. Please write.

JOHNSON GAS APPLIANCE CO.
Cedar Rapids IOWA

Pacific Coast Representative—C. B. BABCOCK CO.
135 Bluxome St., San Francisco, Calif.

TAPPAN
Supremacy

is not a newly-won achievement, but an old and accepted standing in the eyes of gas appliance men and the public alike. No other gas range combines so many outstanding superiorities into such a perfect whole—the TAPPAN Insulated Oven gas range.

H. R. Basford Co.
665 Howard St.
San Francisco

H. R. Mayer
1001 E. 1st St.
Los Angeles

F. W. Schwab
2512 N. Stevens
Tacoma

ANNUAL DIRECTORS' TOUR OF MINNESOTA NORTHERN POWER

The annual directors tour of the Minnesota Northern Power Co., through the territory served by the company and its subsidiaries, was begun on September 22, the party returning to Minneapolis on September 28.

Points visited included Bismarck, Mandan, and Minot, N. D.; Great Falls, Mont.; Buffalo and Sheridan, Wyo.; Rapid City, S. D., and Wausau, Wis., the visitors giving particular attention to the new gas properties of the company in the above named towns.

The entire trip was made by private car. Included in the party were R. M. Heskett, Wilbur Hayes, Robert Drew, H. D. Whitehouse, Merrill Cohen, Joseph A. Auchter, George E. Fleischmann, John C. Benson,, V. L. Rotering, Theodore Wold, Harry Thrall, D. E. Gruenhagen, C. C. Yawkey, Ben Alexander, Jud Alexander, H. L. Geisse, A. P. Woodson, Cecil W. Smith, H. H. Hammer and Harold Holmes.

EL PASO SALES DIVISION GETS RESULTS IN SALES PROMOTION

Charles H. Price in charge of sales for the Texas Cities Gas Co., at El Paso, announces that the sales division of that company is now averaging sales of $5,000.00 per week in El Paso. These sales average weekly about 25 space heaters, 10 conversion installations, 75 house piping jobs, and 35 miscellaneous appliance sales.

Since the arrival of natural gas in El Paso last year, the company has converted and installed central gas heating equipment in 34 large apartments, 25 public schools, 12 office buildings, five hotels, two hospitals, two private schools, and in the public library.

WORTHINGTON PUMP CORP. TAKES OVER GILMAN MFG. CO.

Announcement was made in October that Worthington Pump & Machinery Corp., New York, has acquired the Gilman Manufacturing Co., East Boston, Mass., manufacturer of rock drilling equipment. George H. Gilman, head of the company bearing his name, becomes a member of the Worthington staff, and all employees of the Gilman company are being retained in the new set-up.

LOS BANOS SYSTEM OF COAST COUNTIES IN SERVICE

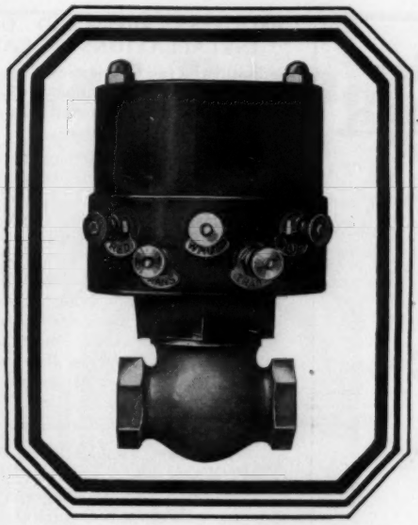
An expansion program as outlined by Coast Counties Gas and Electric Co., of Santa Cruz, Calif., has been going forward according to schedule, and the completion of the distribution system at Los Banos marks another mile post. Systems have already been completed in Dos Palos and Gustine in the same district.

WEST TEXAS GAS CO. READY TO BEGIN DIMMITT SERVICE

J. L. Ryan, superintendent of the West Texas Gas Co., headquartered at Lubbock, Texas, announces that plans are complete for beginning natural gas service at Dimmitt. Supply will come from the South Plains Pipe Line Co. transmission line from Amarillo fields to Midland and Odessa.

STANDARD GAS EQUIPMENT CORP. OFFERS EQUIPMENT BULLETIN

Standard Gas Equipment Corp., 18 East 41st St., New York, recently brought from the press Vol. 1 No. 1 of a New Equipment Bulletin. The bulletin will be issued monthly, and will carry news regarding appliances placed on the market by the company.



No HUM-M-M *or BUZ-Z-Z*

in the Teeple Electric Gas Valve

WHEN home owners spend good money for automatic temperature control and get a clatter of machinery, humming coils, or the buzz of a motor valve held open by heavy current, the result is service calls. The Teeple Electric Gas Valve is designed for silence—designed so noises which with other valves cause expensive service calls, are not possible with Teeple. Indeed, except for the few seconds during which the valve is opening or closing there is nothing—either electrical or mechanical—to produce the least noise. Even during the brief periods of operation the precision-built mechanism cannot be heard as it silently, surely does its job. The motor spins noiselessly in bearings that need no oil. In construction, as in design, every detail makes for silence—for freedom from unnecessary service calls.

Not only the quietness of the Teeple valve, but also its absolute dependability, its habit of doing the job in spite of voltage trouble or other adverse conditions, appeals to the wise dealer as well as to the home-owner. No need to consider distance from thermostat to valve—the valve may be 800 feet away and still operate on a door-bell transformer. No need to hire an electrician to make the low voltage connections. They are simple—you can do them yourself in a few minutes.

All these good points and more are included in a folder which shows and tells why the Teeple Electric Gas Valve is superior to others, and at a price which means volume profit to the dealer. Write for your copy.

The Teeple valve is built in standard small sizes (½ in., ¾ in., 1 in.), single capacity per size, with unrestricted openings.

L. R. TEEPLE COMPANY, 540 East 9th St., Portland, Oregon

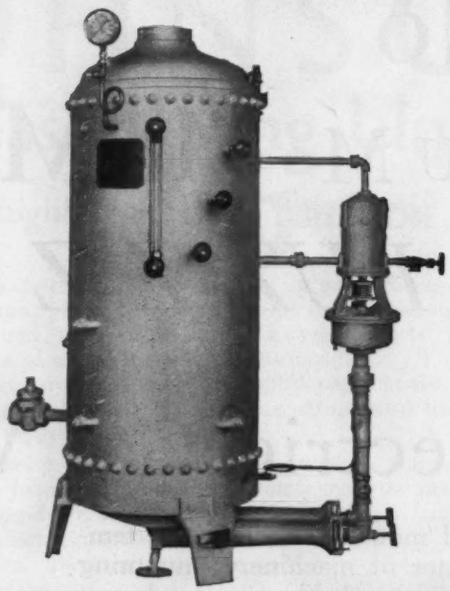
TEEPLE

TEEPLE

ELECTRIC GAS VALVE

Automatic Gas Fired Boilers

LATTNER

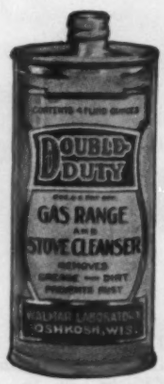


All Sizes from ½ to 30 H. P.

P. M. LATTNER MANUFACTURING CO.

Factory
516 12th Avenue
Cedar Rapids, Iowa

Warehouse Distributor
2646 South Hill Street
Los Angeles, California



ATTENTION! Commercial Members Gas Companies

A Spic and Span gas stove is a credit to the house-wife and can be kept that way by the use of

Removes Grease

DOUBLE DUTY
REG. U.S. PAT. OFF.

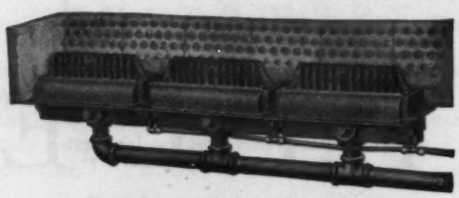
Prevents Rust

GAS RANGE & STOVE CLEANSER

WALMAR LABORATORY Oshkosh, Wisconsin

Western Distributor
C. B. BABCOCK CO., San Francisco, Los Angeles

R. M. C. Gas Burner



Durable Safe Economical

ROTARY MANUFACTURING CO.

5720 Long Beach Avenue Los Angeles, California

PROGRESS REPORTED ON BUTANE INSTALLATIONS IN CALIFORNIA

Natural Gas Properties, Inc. reports active progress during the month of October in its program to take liquefied gas to many California cities and towns.

Franchises have been granted in 19 towns, and applications made in many more. Orders have been placed for the materials and construction is under way on plants and distribution systems in Brawley Rio Vista Isleton, Fairfield, Yreka, Arcata, Ferndale, Fortuna, Dunsmuir and Corning. The system at Vacaville is already complete and in service, as described elsewhere in this issue. Altogether, about 400 miles of distribution lines will be used in the various systems. The expenditure will amount to approximately $1,500,000.

TWO GAS FRANCHISE ELECTIONS FOR MUSKOGEE IN NOVEMBER

The citizens of Muskogee, Okla., will vote on two gas questions during November. On November 6, an election will be held for the renewal of the franchise to the Oklahoma Natural Gas Corp. for a period of 25 years. The present franchise of Oklahoma Natural expires November 14, 1930.

A special election has been called for November 18 to submit amendments to the franchise of the Muskogee Natural Gas Corp., granting the company the right to extend its mains throughout the city.

Muskogee is supplied by three gas companies, Oklahoma Natural, Muskogee Natural and The Municipal Gas company.

MAILING PIECE FOR DEALER DISTRIBUTION BY PAYNE

A mailing folder has been prepared by the Payne Furnace & Supply Co., Inc., Beverly Hills, Calif., designed to be supplied to jobbers and dealers for distribution to mailing lists selected by them with their names printed thereon. The folder illustrates typical Payne appliances and the manner of installation in the average small home of the various types of heating equipment manufactured by the company.

ODEM, TEX., TO BE SERVED BY UNITED GAS SYSTEM

United Gas Corp. of Houston, Texas, is taking natural gas service to the town of Odem, in San Patricio County, the company constructing a line from Sodville. Work on the distribution system is going on simultaneously with transmission line construction.

NEW LINE TO BE CONSTRUCTED TO JONES CITY, OKLA.

Officials of the Pioneer Gas Utilities Co., headquartered at Oklahoma City, have announced that the company will soon begin construction of a line to Jones City, Okla. The line is to connect with one already laid from the Oklahoma City Field eastward to Choctaw and Harrah.

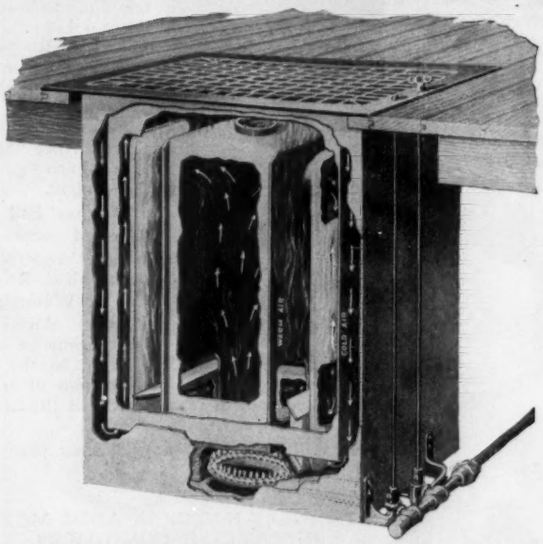
RAY COLCORD CO. AWARDED FOUR NEBRASKA PERMITS

C. M. Van Pelt, representing the Ray Colcord Co., of Wichita, Kan., has been granted natural gas franchises in Blue Hill, Upland, Lawrence, and Hildreth, Neb. Supply will come from the Amarillo-Chicago line.

COALGATE FRANCHISE GOES TO MIDWESTERN DISTRIBUTING

The Midwestern Distributing Co., of Coalgate, Okla., has been granted a 25-year gas franchise in that town.

Record-Breaking Demand for PACIFIC FLOOR FURNACES



Features that Make this Furnace Better, and Easier to Sell

1. Floor or wall registers in antique bronze or brushed brass finish.

2. Five large heat radiating surfaces (four sides and top) utilizing all heat in gas.

3. New method of casing construction, exclusive with Pacific, keeps casing cool at all times, and insures abundance of air to heating chamber for re-heating. **There is no heat loss through outer casing.**

4. Heating unit of 20-gauge pure ingot iron. Pressed and welded joints are absolute insurance against leakage. Extra heavy cast iron dome superheats air before it passes into room.

5. Raised-tip Bunsen type burners, with clean-drilled flame holes and soapstone tips. Long heat travel of burned gases and indirect method of venting allow hot gases to come in contact with greater radiating surface than possible in other designs.

6. Three sizes, to meet the needs of any type or size of building.

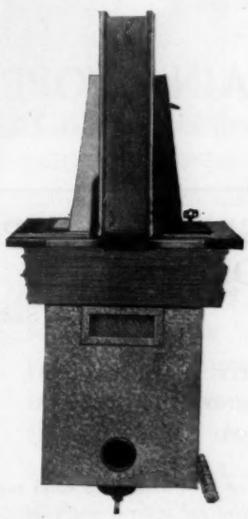
7. Adaptable to any type of modern electric or hand control.

Our Agency Proposition is Attractive . . . Write for Particulars on Your Locality

BUSINESS IS GOOD with Pacific Gas Dealers. 1930 is proving one of the most successful seasons in their history. Pacific Floor Furnaces and other Pacific Gas Appliances are selling and selling fast.

There are good reasons for this record-breaking demand. Success in selling any product comes from giving the public what it wants, and Pacific Gas has been providing what the public wants in gas-heating equipment for nearly a quarter of a century. The quality of Pacific Gas Appliances, their adaptability to the needs of your customers, are two of the factors responsible for the great salability of the products.

The Pacific Gas Agency is a more profitable connection today than ever before. Why not write us for full details?



THE PACIFIC DUAL SYSTEM

Identical in quality and construction with regular Pacific Floor Furnace, but has two registers. Delivers heat into two rooms at once, or may be used in either room alone. Every Pacific Furnace is fully guaranteed in every detail of material and workmanship, with nearly 20 years of reliable dealing behind the guarantee.

Pacific Gas Radiator Company

Gas Heating **Headquarters**

Roseberry and Walter Streets
Huntington Park **California**

Gas-Steam Radiators

Round Furnaces

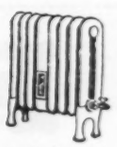
Dual Pipeless Furnaces

Fireplace Radiant Heaters

Recess Radiant Wall Heaters

Automatic Storage Hot Water Heaters

Pipeless Floor Furnaces


Gas Radiators—Pressed Metal and Cast Iron

Agencies Throughout the West

Call for a Pacific Heating Engineer

MANUFACTURERS *of* EVERY TYPE *of* GAS HEATING APPLIANCE

STOPPERS SINCE 1897

GOODMAN GAS MAIN STOPPER
Used since 1897
Improved Locking Sleeve

Street Department Supplies

Goodman Stoppers
Goodman Cylindrical Stoppers
Gas Main Bags
Canvas-covered Bags
Inflating Bulbs
Pumps
Respirators
Krupa-Hendry Test Cap
Pressure Gauges,— portable and stationary
Gas Sampling Bags
Service Cleaners
Service Testers
Joint Runners
Calking Tools
Mittens and Gloves
Rubber Boots
Service Plugs, Rubber
Gas Main Plugs
Soft Wood Plugs
Pipe Cleaning Brushes
Soap Tape
Air-Line Masks
Packings

SAFETY GAS MAIN STOPPER CO.
523 Atlantic Ave., Brooklyn, N. Y.

STANDARD MANAGEMENT & OPERATING CORPORATION

225 Bush Street San Francisco, Calif.

PUBLIC UTILITY MANAGEMENT
ENGINEERING AND CONSTRUCTION
REPORTS AND APPRAISALS

The staff includes the following who have been associated with successful nation-wide public utility enterprises for several years past.

E. F. ENGLISH
E. A. OLSEN
R. N. DREIMAN
J. B. WILSON
A. E. HALL
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FORNEY

COMBINATION GAS and OIL BURNERS

For Power Plant and Industrial Uses

Write for Literature and List of Installations

FORNEY COMBUSTION ENGINEERING CO.
305 THOMAS BLDG., DALLAS, TEXAS

FRANK J. REYNOLDS JOINS FORCE OF PITTSBURGH EQUITABLE

Frank J. Reynolds

PITTSBURGH Equitable Meter Co. announces the addition of Frank J. Reynolds to the company's sales force. Mr. Reynolds will be associated with the Emco orifice meter and Emco gauge department.

He has had 10 years of successful selling experience with the Bristol Co. of Waterbury, Conn., during which time he specialized in the introduction of similar new equipment in a variety of industries from coast to coast.

He will be located at the home plant in Pittsburgh, Pa.

ARKANSAS NATURAL ADDS MORE INDUSTRIAL CONSUMERS

Arkansas Natural Gas Corp., headquartered at Shreveport, La., has added several large consumers to its lines recently.

Connections have been laid to the Arkansas Valley Compress Co., at the U. S. Aviation Field east of Little Rock. Annual consumption is estimated at 20,000,000 cubic feet.

Russellville's first industrial user, The Arkansas Oklahoma Ice Co., will use natural gas, adding 26,000,000 cubic feet to the company's annual load.

St. Louis and Southwestern Railroad Co. will use gas in its shops at Pine Bluff, which will require about 130,000,000 cubic feet annually.

HARTLEY TO BE ADDED TO MAINS OF DALHART GAS CO.

O. E. Duggins, manager of the Dalhart Gas Co., Dalhart, Texas, announces that plans for beginning service in Hartley, some 10 miles distant, are practically complete. Work was moving rapidly forward on the distribution system late in September, and service was expected to begin some time in October. Eighty per cent of the residents of Hartley had signed for gas on October 15.

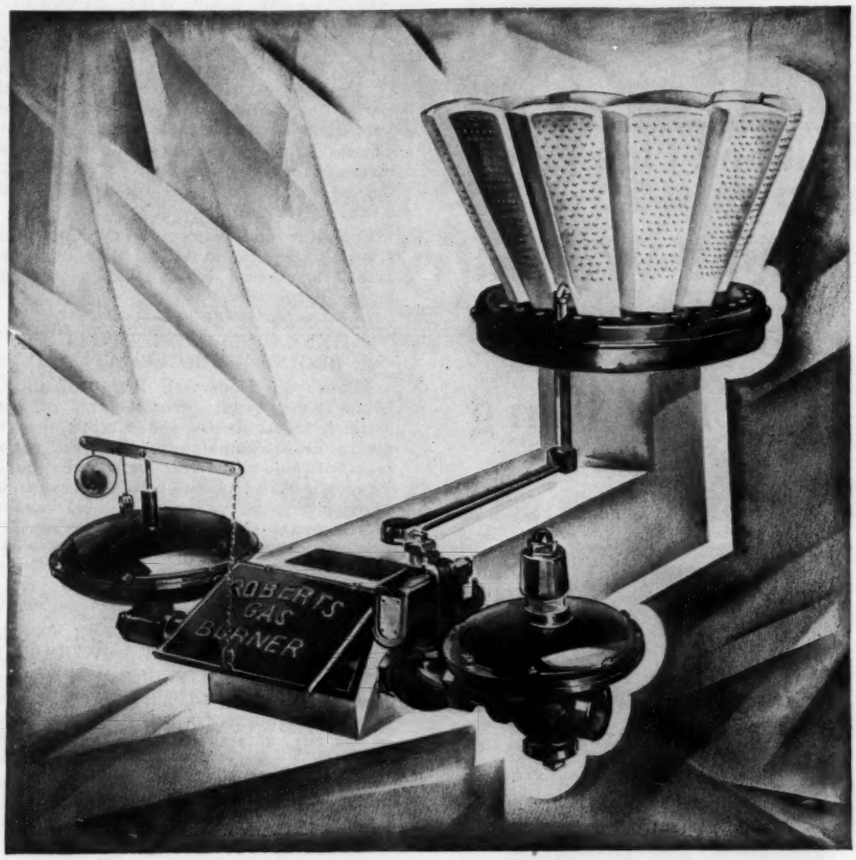
Other towns served by the Dalhart Gas Co. are Texline and Channing.

SAFFORD AND DEMING APPROVE TERMS OF FRANCHISE

Terms of the proposed franchise for Deming, N. M., and Safford, Ariz., have been approved by both city councils, and the matter will come to a vote. The petitioning company is Natural Gas Service Co., affiliated with the Western Gas Co., headquartered at El Paso, Texas. The Western Gas Co. plans construction of a major gas transmission line from El Paso to mining centers in Arizona. Survey of the line is now complete to Globe and Miami, Ariz.

SOUTHERN UNION GETS HARRISON ARK., NATURAL GAS FRANCHISE

Harrison, Ark., has granted a natural gas franchise to the Southern Union Gas Co., of Dallas, and to the Arkansas Western Gas Co., a subsidiary of Southern Union. The company is planning to apply for a franchise in Eureka Springs in the same territory.



Built for years of sustained service

WHEN you sell the health and comfort features of the Roberts Controlled Gas Heating Unit—you are selling your customers a genuine service. But do not overlook the fact that you are also selling a mechanical device that must continue that same service over a period of years, without mechanical breakdowns and expensive "free service."

That's what thousands of Roberts users have found. The mechanical features are so nearly perfect that the Roberts will continue to give a sustained service—for a lifetime. This fact coupled with the knowledge that the Roberts was designed and built by a man and an organization that knows gas heating, is why so many big utility men have helped to establish new sales records for the Roberts this year.

Today—many Gas Companies have installed a home heating department for the sale of the Roberts Controlled Gas Heating Unit, where several years ago, before the advent of the Roberts, this was impossible. Today they are not only selling a genuine service to their customers, but they are reaping large rewards in increased gas revenue.

Why don't you investigate the possibilities of merchandising the Roberts in your city? Gladly will we give you the benefit of our experience in organizing home heating departments for other gas companies. At any rate, send for our new book entitled "Sell Health and Comfort in the Home."

ROBERTS-GORDON APPLIANCE CORPORATION
DELAWARE AVENUE AT TUPPER STREET
CURTISS BUILDING BUFFALO, N. Y.

ROBERTS CONTROLLED GAS HEATING UNIT

VITEX

—the perfect Gas Vent and Flue Pipe

Light Weight
Non-Corrosive
Insulating

. . . and Easier and Cheaper to Install than other Heavy Types of Pipe . . . . . .

For fully descriptive catalogue and prices write

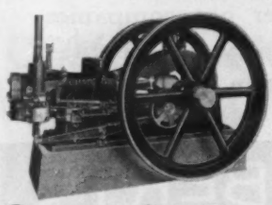
PLANT RUBBER and ASBESTOS WORKS

537 BRANNAN STREET . . . . SAN FRANCISCO

PR-070

CHARTER NATURAL GAS ENGINES

Are Unsurpassed Where Economy, Long Life And Utmost Dependability Is Desired



Made in 20 to 200 H. P. Sizes—1 and 2 cylinders. Slow Speed, Horizontal, Stationery, Long Stroke.
A Thoroughly Tried Out Engine for All Purposes

Write For Full Information—Now

CHARTER GAS ENGINE COMPANY - STERLING, ILLINOIS
Manufacturers of Dependable Gas Engines Since 1880

E. P. ROWLAND WILL SUCCEED J. M. GRIMES AT PARIS, TEX.

J. M. Grimes, manager of the Paris office of the Texas Cities Gas Co., headquartered at Dallas, has resigned that position, the change to become effective in November, according to an announcement made by Chester L. May, vice-president and general manager of the Community Natural Gas Co., of Dallas, affiliated organization of the Texas Cities.

E. P. Rowland, manager of the Community Natural Gas Co., at Hugo, Okla., has been named to succeed Mr. Grimes as manager of the Paris office.

MINNEAPOLIS-HONEYWELL CO. BEGINS RADIO BROADCAST

Minneapolis-Honeywell Regulator Co., of Minneapolis, Minn., manufacturer of automatic heat regulators and controls, has begun a radio campaign to place the advantages of automatic heat before the public. The Minneapolis symphony orchestra has been selected to offer the musical numbers to accompany the advertising program. The first two programs have already met with a good response, according to C. B. Sweatt, vice-president of the company.

HOUSTON GAS AND FUEL WILL SERVE SCHOOLS AT LOW RATE

Houston Gas and Fuel Co., of Houston, Texas, has contracted with the school board to supply natural gas for all public schools of the city, at a rate of 20c per 1000 cubic feet. It is estimated that about $20,000 will be saved. Seventy-five schools are now using natural gas, according to H. L. Mills, business manager of the public school system.

O. W. BOCKELOH OF GREAT FALLS DIES WHILE ON TRIP TO SHELBY

O. W. Bockeloh, manager of the Great Falls Gas Co., died suddenly at Shelby, Montana, October 18. Mr. Bockeloh had gone to Shelby on company business, and was found dead in his hotel room.

Mr. Bockeloh came to Great Falls from Sault Ste. Marie, Ontario, last May, succeeding A. H. Sikes. He is survived by the widow and four children.

BROCHURE FEATURES SMOOTHTOP ONE-BURNER COOKING

Standard Gas Equipment Corp., New York, has brought from the press a booklet entitled "This New Cooking," featuring one-burner cooking with the Smoothtop range. The booklet is designed for general distribution and contains recipes and new ideas for cooking a whole meal on one burner. Copies may be obtained from offices of the Standard Gas Equipment Corp., 18 E. 41st St., New York, N. Y.

NEW TECHNICAL DICTIONARY FOR FOREIGN PERIODICAL READERS

Hubert Hermanns of Berlin, Germany, has recently brought from the press the second edition of his Techno-Dicitionary, designed to assist the reader of technical material in translating books and periodicals in foreign languages. It contains a German-English-Italian, English-German, and Italian-English vocabulary.

EIGHTH ANNUAL MEETING OF A.I.S.C. AT PINEHURST

The Eighth Annual Convention of the American Institute of Steel Construction is being held at the Carolina Hotel, Pinehurst, N. C., from October 28 to November 1.

THE UNIT-OR HEATER

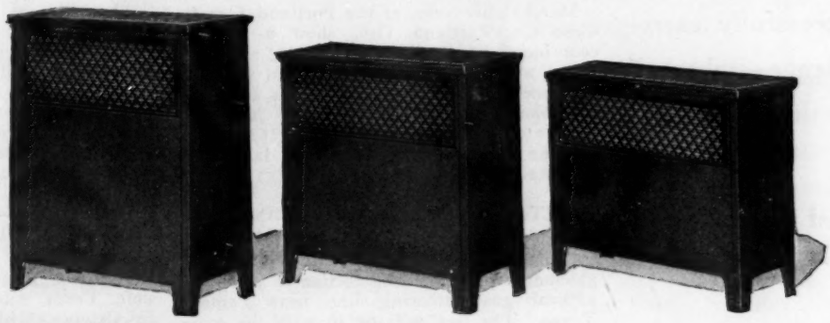
a Union of Efficiency and Beauty will INCREASE YOUR SALES

A.G.P. UNIT-OR GAS FIRED
AMERICAN GAS PRODUCTS CORP. NEW YORK, N.Y. U.S.A.

UNIT-ORS are easy to sell because:-

1. **APPEARANCE:** The UNIT-OR meets the modern demand for better looking appliances. Its gracefully balanced design and beautiful finish harmonize with and add beauty and charm to any room.
2. **EFFICIENCY:** The UNIT-OR produces warm air in large quantities uniformly distributed throughout the room. The burner, of new design, together with the cast iron heating element with absorption ribs on the inside and radiating fins on the outside, insures high efficiency when used either vented or unvented.
3. **DURABILITY:** The heating element and burner are constructed entirely of cast iron; heavy gauge highly finished steel is used in the casing, insuring long life.
4. **CONTROL:** The UNIT-OR can be supplied with three different controls—Hand Control—Thermal Control, which increases or decreases gas consumption in accordance with changes in the temperature of the heater itself—and Room Temperature Control, which increases or decreases the gas consumption with the changes in temperature of the room itself.
5. **SAFETY:** Laboratories have found the UNIT-OR to conform to all safety requirements.
6. **SALABILITY:** The UNIT-OR is new, beautiful in appearance, easy to assemble, efficient and different from any of the conventional types of space heaters. It strikes an entirely new note in the science of gas heating—and best of all it is not expensive.
7. **ASSEMBLY:** The UNIT-OR is completely assembled on the job without the use of bolts or screws. There are three packages—a crate containing the cast iron Unit—a small crate containing the burner and control — and a cardboard carton containing the casing. Each carton contains a pictured assembly construction sheet.

A NEW STYLE OF GAS-FIRED HEATERS FOR HEATING HOMES, OFFICE BUILDINGS, CHURCHES, APARTMENTS, THEATRES, SCHOOLS

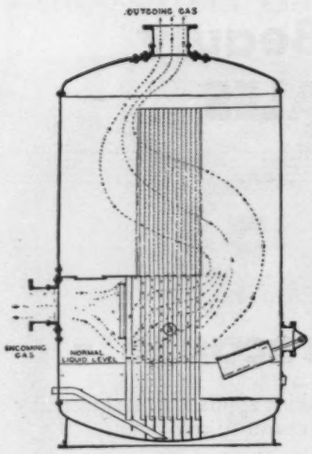


UNIT-OR HEATERS (Gas Fired) Made in three sizes to meet every heating need. Each size may be had in either walnut finish or dark green crystalline enamel.

Send us your Name and Address for descriptive booklet about UNIT-OR

AMERICAN GAS PRODUCTS CORPORATION
Chrysler Building, New York

Skids At the Corners



THAT is what happens to any mist that tries to get through a Campbell MIST-D-FIER.

The gas furnishes the speed, the MIST-D-FIER the corners. Result—The mist loses out in the race, for the gas is too speedy for it. The gas finishes dry, dry as a bone.

The MIST-D-FIER lives up to its name by successfully carrying out its challenge—takes **all** the mist out of the gas; that's right, ALL.

Fully explained in Bulletin No. 6. Write for your copy today.

J. A. CAMPBELL CO.
Natural Gas Engineers
CONSULTING DESIGNING CONSTRUCTING
PHONE-41693
P.O. DRAWER 669
LONG BEACH, CAL.

STEARNS-ROGER MFG. CO., DENVER
MID-CONTINENT AGENCY

Interior view of American Meter Co. laboratory at Albany, New York.

American Meter Co. Expands Research Facilities

ADDITIONS to the floor space, equipment and personnel of the Albany laboratory of the American Meter Co. have recently been completed. The laboratory now occupies an area of 950 square feet. It specializes in experimental and testing work relative to low pressure measurement. Activities are coordinated with the company's research laboratory at Metric Metal Works, Erie, Pa.

To maintain a uniform room temperature essential for proving tests, the Albany laboratory is equipped with an automatic temperature regulation and ventilation system. By this means stratification of the air is prevented and the temperature maintained within narrow limits.

The air supply for the provers is furnished by a low pressure blower, which draws the air from the vicinity of the provers and admits it to the provers at a pressure only slightly above atmospheric.

A light non-volatile mineral seal oil is used in the provers as a sealing medium. This oil, due to its low specific heat, readily follows gradual changes in room temperature. Its specific heat is not low enough, however, to permit it to follow rapidly the sudden rise in room temperature which occurs in the early mornings during the winter months when the drop in temperature during the night is brought back to normal. In order to bring the oil temperature up to that of the room, under such conditions, the oil is circulated through an electric heater, being pumped out of the prover, circulated around the heating coils and back into the prover.

To facilitate the conducting of proving tests with both large and small meters, the laboratory is equipped with a five-cubic foot, a 10-cubic foot and a 100-cubic foot prover.

50 PER CENT GAIN IN APPLIANCE SALES FOR PORTLAND CO.

Merchandise sales of the Portland Gas & Coke Co., Portland, Ore., show a 50 per cent increase for September, 1930, as compared with September, 1929. Total sales of appliances for September, 1930, as reported by John H. Hartog, commercial manager for the company, amounted to $78,163, while for the corresponding month of last year the total was $50,841.

CITIES SERVICE TO LAY NEW GATHERING LINE AT PAMPA

Cities Service Gas Co., Kansas City, has announced plans for construction of a 16-inch natural gas gathering line near Pampa, Texas. The line will tie in with the company's main 20-inch line leading from the Pampa field and is for the purpose of making available a greater supply of gas for the company's 20-inch line serving Kansas City and other northern points.

REGINA EMPLOYS DAVIS TO ADVISE ON FRANCHISES

The city of Regina, Sask., on Oct. 2 appointed Herbert R. Davis, Buffalo, N. Y., to look into all natural gas franchise proposals now before the city, and to advise the council as to the most advantageous offer so far submitted.

The cities of Moose Jaw, Swift Current and Saskatoon have also authorized an appropriation for employing an expert to advise on similar franchise proposals.

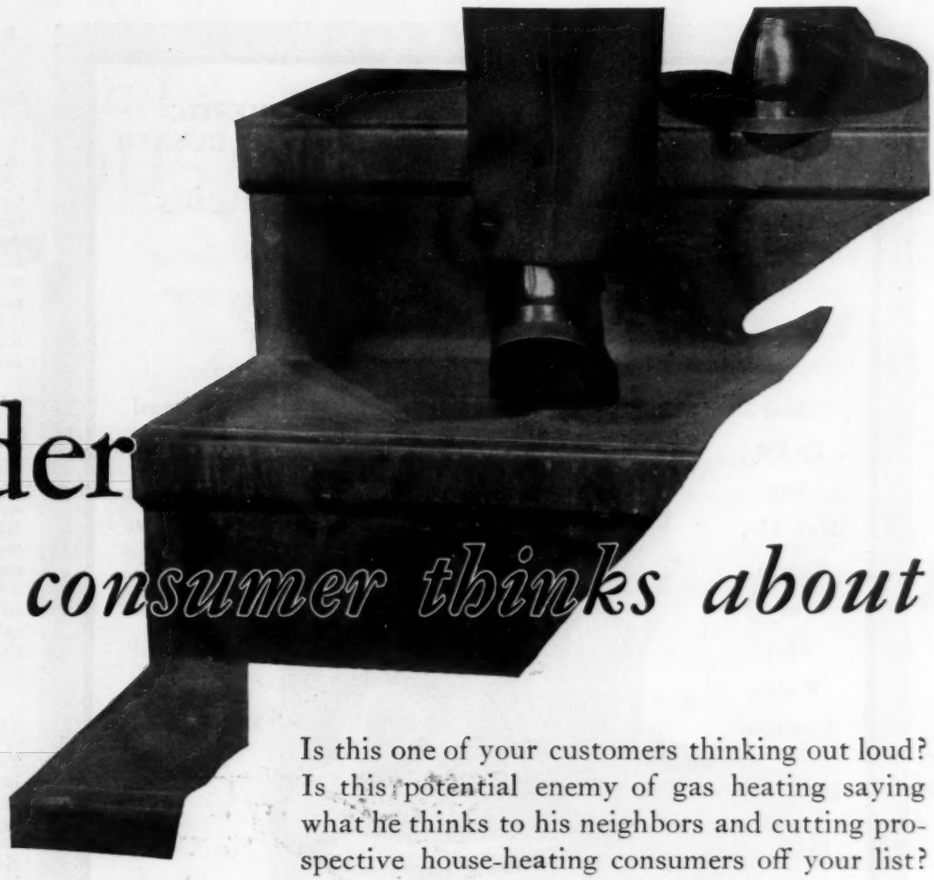
The Western Canada Fuel Association is taking steps to resist the natural gas operators in the proposed extension of natural gas to Saskatchewan centers, but it is believed that the Saskatchewan people are entirely sympathetic to the idea of natural gas.

SEMINOLE, TEXAS TO BE SERVED BY WEST TEXAS GAS CO.

Work on the distribution mains at Seminole, Texas, was making good progress late in October, with a promise of service by November 15. The town is served through the mains of the South Plains Pipe Line Co., by the West Texas Gas Co., distributing unit of the organization. Headquarters for both companies are in Lubbock, Texas.

ADDITIONS TO TEXAS CITIES GAS CO. SALES DIVISION

The Texas Cities Gas Co., at El Paso, Texas, announces the addition of R. C. Rogers, Jr., and F. A. Hughes to the company's sales division.



Wonder *what the consumer thinks about when his gas heating plant is NOT automatic*

"This gas bill looks pretty high to me. Maybe I'm wrong, but they sure painted a pretty picture about low fuel bills when they sold me that gas burner for my heating plant.

"And I believed all that talk about solid comfort and less work if I put in gas heating. Solid comfort? Yes, that's what we have, if you can call a house that is always too warm or too cold comfortable. Less work? Sure, we don't have to work quite so hard. But what do you call chasing up and down stairs a dozen times a day to turn the gas on or off, if it isn't work?

"These gas heating advertisements in the magazines burn me up. 'Just light the pilot in the fall, set the thermostat, and be comfortable all winter.' Where's my thermostat? Where's my comfort? I certainly didn't get the convenience I thought I was buying."

Is this one of your customers thinking out loud? Is this potential enemy of gas heating saying what he thinks to his neighbors and cutting prospective house-heating consumers off your list?

You can breed more like him, or you can make sure that this year's crop of house-heating customers are completely satisfied. Your recommendations are usually followed. If the heating plant goes in without automatic controls, watch out for dissatisfied customers. If it goes in completely equipped with good automatic controls, you win a friend for life, and all the benefits of a friend's unqualified recommendations to his neighbors.

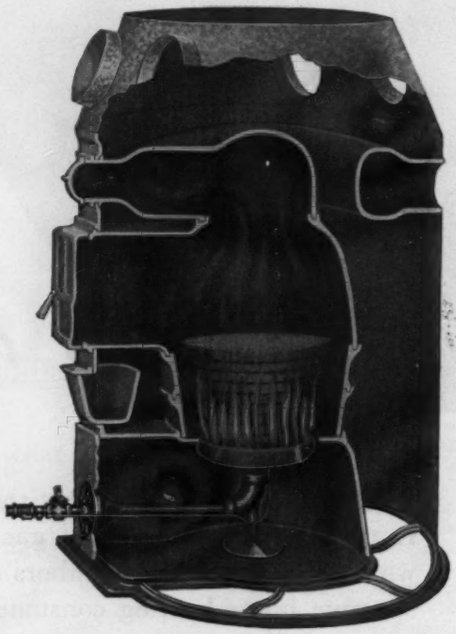
Good automatic controls, as most men in the gas industry know, mean Minneapolis-Honeywell automatic controls. Minneapolis-Honeywell Regulator Co.

CALIFORNIA BRANCH
557 Market Street, San Francisco, California
DISTRIBUTORS
Portland, Seattle, Salt Lake City, Denver

MINNEAPOLIS HONEYWELL
HEAT REGULATOR

AND NOW THE NEW **MAXON** DOMESTIC BURNER

For Maintaining High Efficiencies



Sizes To Fit Any Hot Air, Steam, or Hot Water Furnace

Produced From 15 Years Experience as Builders of High Quality Gas Burners

SIMPLICITY OF DESIGN with the correspondingly small number of parts has enabled us to build this furnace unit with the highest quality materials and precision workmanship and still offer it to you (with or without thermostatic control) at a— VERY LOW COST

Telegraph for prices, capacities, publicity material to

THE MAXON PREMIX BURNER COMPANY

MUNCIE, INDIANA, U. S. A.

Reynolds Gas Control Since 1892

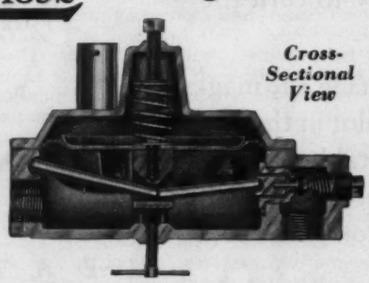
Reynolds Little Giant Regulator

Products for all kinds of Pressure Reduction—for either artificial or natural gas.

GOVERNORS—Intermediate Pressure, Triple Outlet, Holder, Toggle Type Street.

REGULATORS—High Pressure Service, Low Pressure Service, High Pressure Line, Single and Double District Station.

VALVE—Automatic Quick Closing Anti Vacuum.



Cross-Sectional View

Reynolds Gas Regulator Company
Anderson, Indiana

BRISTOL HUMIDITY CONTROLLER IN SATURATING NATURAL GAS

The Bristol Company, Waterbury, Conn., has developed a control system for automatically controlling gas humidity where steam is used to saturate natural gas before it enters the city distribution system.

The control system consists of a wet bulb thermometer control instrument with bulb in the gas line, a diaphragm motor valve in the steam line furnishing steam for saturation, and a wet and dry bulb recording thermometer for recording the humidity of the saturated gas.

Under operation, the controller automatically maintains 100 per cent gas saturation for all rates of gas flow.

MISSOURI POWER & LIGHT PLANS TO SERVE THREE MORE TOWNS

Missouri Power & Light Co., of Kansas City, Mo., has applied to the State Public Service Commission for permission to construct gas distribution systems in Sturgeon, Hallsville and Laddonia. Each of these towns has voted a 20-year franchise to the company. Boonville is also expected to grant a franchise in the near future, the city council of that town having approved it and called an election to put it to a vote of the citizens.

KETTLEMAN HILLS GAS TO BE USED IN P. G. AND E. LINE

Milham Exploration Co., selling gas to Pacific Gas and Electric Co., for distribution in San Francisco, and other central and northern California towns, has voluntarily agreed to discontinue its entire production at Buttonwillow field and to use gas from the Kettleman Hills field which is now being blown to the air. It is estimated that this step will conserve 15 million cubic feet of gas daily.

5,000,000 CUBIC-FOOT WELL BROUGHT IN AT CRYSTAL, IDAHO

A well of the Crystal Dome Oil and Gas Co., near Crystal, Iraho, was brought in on September 29, with an initial flow of 35,000,000 cubic feet of gas daily, and settled down to a production of 3,000,000 to 5,000,000 per day. The structure is located about 15 miles northeast of Payette, and 15 miles southeast of Weiser. The new well is said to be the first producer of gas in commercial quantities in the district.

MORE UTAH FRANCHISES FOR THE McFADYEN-DENNING INTERESTS

John McFadyen and L. B. Denning have been granted a permit by the Utah Public Utilities Commission to supply gas for light, heat and power to Box Elder and Cache counties, and cities of Willard, Brigham, Wellsville, Perry, Hyrum, Logan, Richmond and Smithfield. Wasatch Gas Co., headquartered at Salt Lake City, will distribute the gas.

GENOA, NEB., TO GET GAS FROM NORTHERN NATURAL LINE

A franchise has been granted by the city of Genoa, Neb., for the service of natural gas by the Iowa Nebraska Light & Power Co. Supply will come from the Northern Natural Gas Co., Panhandle to Des Moines major carrier.

MERCO NORDSTROM OPENS NEW OFFICE AT CHARLESTON

Merco Nordstrom Valve Co. has opened an office in Charleston, W. Va., at 304 Capitol Street. The office will be under the management of H. D. Ruos.

USEFUL YET HARMONIOUS

Modernization is the dominant theme in real homes today, therefore the conventional old-style gas heater is a thing of the past.

The Payne Console not only carries out the very newest ideas in luxurious heating comfort . . . but offers a startlingly new note in modern home furnishings. Outwardly it resembles a fine console radio. It stands close to the wall . . . circulates fresh, pure warmth when you need it . . . but it also serves as a stand or table for flowers, books or bric-a-brac.

You can sell it any month of the year . . . and all year 'round it stays on the job . . . building the load . . . a constant source of pleasure as well as health and comfort.

Write or wire for a description of the various models, if you have not already done so.

Gas heaters are no longer thought of merely as a cold weather necessity but the Payne Console Heater is the first to harmonize completely with the individual home decorating plan.

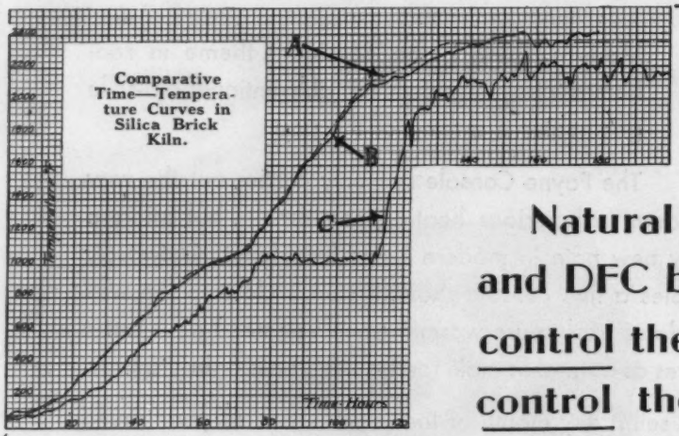
PAYNE Console HEATER

Warehouse—Buffalo, N. Y. Dealers Everywhere
Jobbing Connections in Principal Cities

MANUFACTURED ONLY BY THE PAYNE FURNACE AND SUPPLY COMPANY, INCORPORATED
BEVERLY HILLS, CALIFORNIA

Payne

THERE'S A PAYNE HEAT SYSTEM FOR EVERY CLIMATE AND BUILDING



DFC

Natural Gas and DFC burners control the burn; control the cost.

Checked hourly against another fuel in a silica brick plant, natural gas burned through DFC Atmospheric Type Burners gave above time temperature curve B. Other fuel gave curve C. Note how closely curve B for gas firing follows the ideal time temperature curve A.

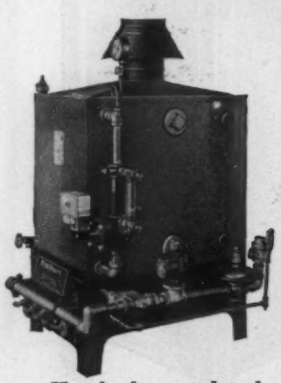
Per 1000 9-in. equivalent, gas required 26,743—815 B.T.U. and the second fuel required 33,164 B.T.U.—or 19.4% more than gas. Gas required 178 hours to complete burn. other fuel required 205 hours.

Write for Bulletin 305 for complete data on burner used for above.

THE DENVER FIRE CLAY COMPANY

DENVER DFC COLO. U.S.A.

BRANCHES AT SALT LAKE CITY, EL PASO, AND NEW YORK



The Pittsburg A Famous Boiler

The crowning engineering achievement in the gas boiler industry has been the design and perfection of the famous "Pittsburg" Boiler, the most advanced gas-fired house-heating boiler of the day.

Hundreds upon hundreds of installations have definitely proven the superiority of the "Pittsburg," achieving a fame that is rapidly spreading to all parts of the country.

Back of the design and construction of the "Pittsburg" Boiler rests the manufacturing resources of the worlds' largest water heater manufacturers—The Pittsburg Water Heater Company.

The "Pittsburg" label on these boilers is your assurance of the highest mechanical and engineering perfection, a service organization that extends into every town and city of any importance in the land, and an iron-bound guarantee of proven dependability.

Just as "Pittsburg" Water Heaters have demonstrated their superiority, so you will find "Pittsburg" Boilers rendering unsurpassed service wherever installed.

Write for booklet, prices and discounts.

"Efficient House Heating With Gas."
"Pittsburg House Heating Boilers."

Pittsburg Water Heater Company

Factory and General Office: Pittsburgh, Pa.

Offices in all principal cities.

GREAT FALLS GAS CO SPONSORS FOUR-DAY COOKING SCHOOL

The Great Falls Gas Co., Great Falls, Mont., held a four-day cooking school on the sales floor October 7 to 10 inclusive. Classes were in charge of Miss Grace Jo Mason, home economics expert.

Four thousand personal invitations were mailed out to Great Falls housewives three days before the opening of the school, and 5,000 door knob hangers were distributed through the city announcing the dates. In addition to this several hundred telephone calls were made the day before the opening.

As an added attraction, a range was given away at the last class, while many cakes and other articles of food baked during the demonstration were given away at the close of each session. Attendance was estimated at 500 a day.

PIPE LINE COSTS GIVEN IN NAYLOR PIPE CO. BULLETIN

Naylor Pipe Co., Chicago, Ill., announces a new brochure featuring Naylor line pipe. The booklet is attractively prepared, and contains diagrams, line drawings and halftones showing different phases of the company's "Spiralweld" process, as well as illustrations of the pipe in use. Tables of 6-, 12-, and 14-inch pipe line costs are given, and an analysis of labor expense on 28,020 feet of 6-inch pipe and couplings.

Copies of the publication may be obtained by addressing the company at 1230 East 92nd St., Chicago.

COAST COUNTIES G. AND E. TO SELL PITTSBURG PLANT

Coast Counties Gas and Electric Co., of Santa Cruz, Calif., has applied to the California Railroad Commission for authority to sell its manufactured gas plant at Pittsburg to the Columbia Steel Co., for the sum of $25,000. The plant will be dismantled, and the purchaser will utilize the land upon which it is located for an addition to its steel mill.

ARKANSAS VALLEY GAS CO. ASKS TO SERVE ORDWAY, COLO.

The Arkansas Valley Gas Co., headquartered at Fort Lyons, Colo., and serving Rocky Ford, La Junta and Lyons, has applied for a natural gas franchise in Ordway, the town to be served by an extension of the Rockford lateral.

CENTRAL STATES ELECTRIC CO. TO SERVE GAS AT STERLING

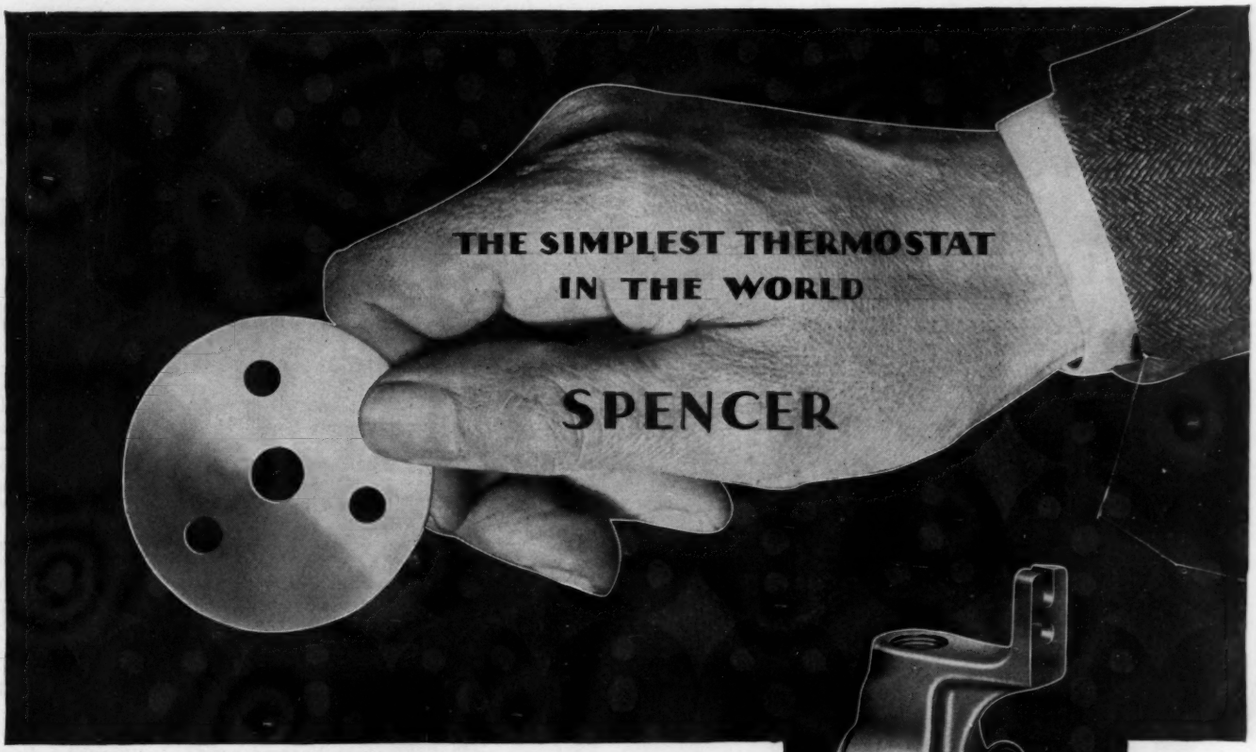
Permission to distribute natural gas in Sterling, Colo., has been granted to the Central States Electric Co. of Colorado by the State Public Service Commission. The company recently purchased the Sterling Gas Co. property for the sum of $137,700.

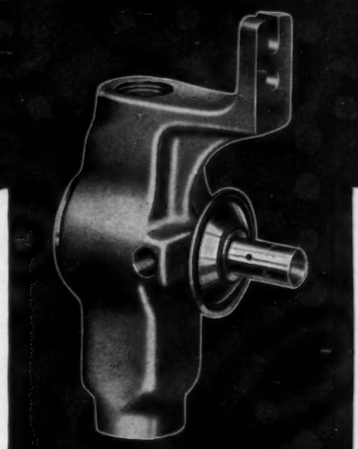
CARBON BLACK PLANT TO BE BUILT BY STANDARD CARBON CO.

Standard Carbon Co., is planning to establish a carbon black plant in the Little Buffalo Basin gas field in southern Fremont County, Wyo. The company recently completed a 4,000,000 cubic foot well in that territory.

O. E. DUGGINS NOW MANAGER OF DALHART GAS CO.

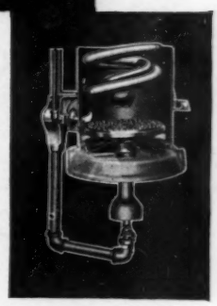
E. H. Harley has resigned as manager of the Dalhart Gas Co., Dalhart, Texas, and his place has been taken by O. E. Duggins, formerly manager of the Clayton Gas Co., Clayton, Texas.





KLIXON SAFETY PILOTS

FOR . . . . . .
AUTOMATIC STORAGE WATER HEATERS



KLIXON Products have the exclusive use of the patented Spencer Snap-Acting Thermostatic Disc shown above. This simple bi-metallic, concave disc is a complete thermostat in itself, snapping from concave to convex and vice-versa at a predetermined temperature. It furnishes its own motive power and acts with a powerful, positive thrust, without the use of mechanical advantages of any kind. As applied to this Klixon safety pilot for circulating tank heaters it shuts off the main gas supply positively if the pilot flame is extinguished for any reason. This safety pilot has been thoroughly tested in use, and is used as standard equipment by some of the largest manufacturers of circulating tank heaters. In its simplicity there is safety, economy, and freedom from trouble.

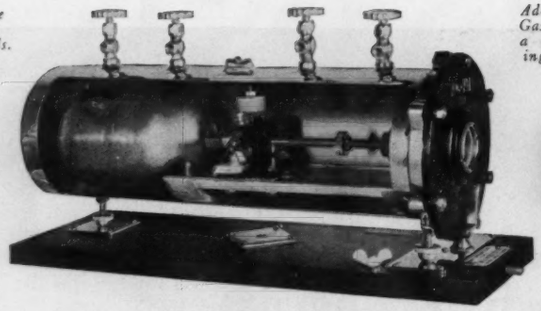
May we send a complete descriptive folder?

SPENCER THERMOSTAT CO

CAMBRIDGE · · · MASS

Pacific Coast Representative, B. W. MUELLER, 447 Sutter St., San Francisco, California

Four Spring Type Recommended by Bureau of Standards.



Adopted by the Natural Gasoline Association as a means for determining the specific gravity of Natural Gas.

So Accurate That—

when properly operated it will give results that can be checked to within three points in the fourth place.

The Improved and Approved
AC-ME GAS GRAVITY BALANCE

This device, one of our complete line of scientific ACcurate-MEasuring equipment, is also portable, and is completely equipped with essential needle valves and a carrying case. Constructed to meet specifications required under various conditions, both in the field, and in the Laboratory. Dependable results on wet or dry gas—natural or artificial.

Send for descriptive folder "W" for complete information.

Also write for Bulletin 15-W showing our complete line of scientific AC-ME equipment.

The Refinery Supply Company

BRANCH:
3404 Main St.
Dallas, Texas

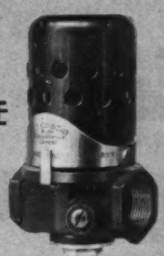
621 E. 4th St.
Tulsa, Oklahoma

Pacific Coast Rep.
The Braun Corp.
363 New High St.
Los Angeles, Calif.

The WILCOLATOR

OVEN HEAT CONTROL

The WILCOSTAT
ROOM TEMPERATURE CONTROL



The WILCOLATOR Co. Newark N.J.

MECHANICALLY COATED AND WRAPPED PIPE

The greatest advance in the protection of line pipe in the past quarter century. Pipe is mechanically coated and wrapped at the mill by the exclusive Hill, Hubbell & Company process. For information, address

GENERAL PAINT CORPORATION
Hill, Hubbell & Company Division
Specialists in the science of protective coatings for industry

Chicago—105 West Adams St. New York—11 Broadway. San Francisco—160 Fremont St. Los Angeles—908 South Main St. Seattle—1406 Dearborn St. Spokane—711 First Ave. Portland, Ore. Tulsa, Okla. Houston, Texas. Dallas, Texas.

EXPORT OFFICES: Head Office—160 Fremont Street, San Francisco, Calif., U.S.A.

Branch Office: 11 Broadway, New York, N. Y., U.S.A.

LINDERMAN JOINS THE STAFF OF PITTSBURGH EQUITABLE METER CO.

Garrett B. Linderman, Jr., has joined the Pittsburgh Equitable Meter Co. organization, and will be located at the main office in Pittsburgh, Pa. Mr. Linderman, who was for a time connected with the Bethlehem Steel Company and more recently with the Metric Metal Division of the American Meter Co., is a Lehigh University man and is well known throughout the gas industry.

The Linderman orifice meter is primarily his invention. He has had many years of experience in research and experimental work in the gas industry.

LOUISIANA GAS & FUEL PLANT TO USE CAMPBELL EQUIPMENT

Louisiana Gas and Fuel Co., of Shreveport, La., will construct a high-pressure gasoline plant near Arcadia, La., and has awarded the contract to the Stearns-Roger Manufacturing Co., Denver, Mid-Continent representative of the J. A. Campbell Co., Long Beach, Calif. The contract calls for Campbell equipment throughout. The plant will handle 30 million cubic feet of gas, and is designed to produce 30,000 gallons of gasoline daily. It is scheduled to be put into operation in 90 days. This is the third plant built for the Louisiana Gas and Fuel Co. within the past two years, in which Campbell equipment has been used.

REPUBLIC STEEL OPENS DISTRICT OFFICE AT TULSA, OKLA.

The Republic Steel Corp., with headquarters at Youngstown, O., has opened a district sales office in Tulsa, Okla., with C. S. Powers in charge as district sales manager, it is announced by Norris J. Clarke, vice-president in charge of sales of the corporation. Mr. Powers formerly was connected with the Republic sales office at Detroit, Mich.

The Tulsa district will include the state of Oklahoma and a portion of Kansas.

PACIFIC GAS AND ELECTRIC TO BUY STANFORD SYSTEM

Pacific Gas and Electric Co., San Francisco, Calif., has applied to the State Railroad Commission for authority to purchase the gas and electric systems serving Stanford University at Palo Alto, from the board of trustees of that institution. Purchase price for the gas system was named at $27,810, and $25,000 for the electric system.

RAYMONDVILLE, TEX., TO GET GAS SERVICE EARLY IN DECEMBER

Natural gas will be available in Raymondville, Texas, early in December, according to an announcement made by C. O. Rockwell, manager of the Rio Grande Valley Gas Co., of McAllen, Texas. The company secured the Raymondville franchise some time ago.

HOUSE HEATING INSTALLATIONS TOTAL 2,792 IN NINE MONTHS

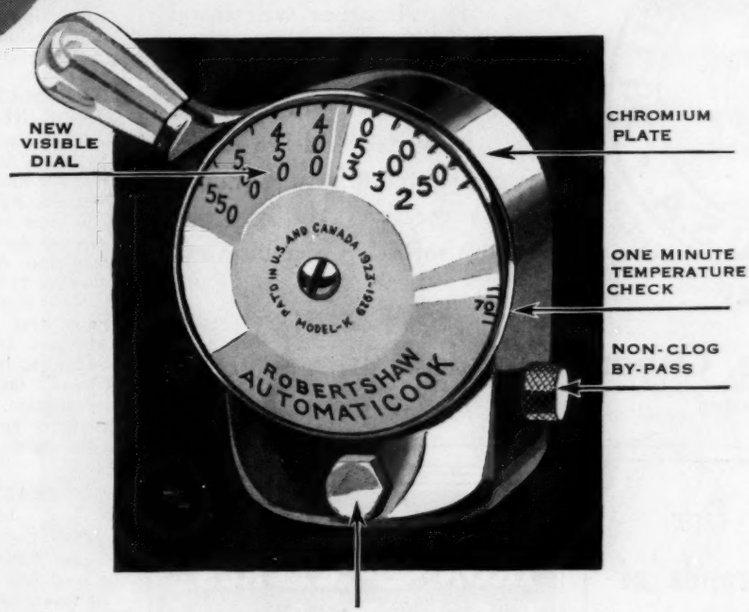
House heating sales crews of the Kansas City Gas Co., Kansas City, Kan., report a total of 2,792 installations made during the first nine months of the year. Of these, 698 were installations of new equipment, the balance being conversion jobs.

CONCORDIA FRANCHISE SOLD TO KANSAS P. L. & GAS CO.

Announcement is made of the sale of the natural gas franchise at Concordia, Kan., to the Kansas Pipe Line & Gas Co., headquartered at Salina. The franchise was formerly owned by the Gas Corporation of Concordia, municipally owned.

5 FEATURES!

make the "K" Type Robertshaw's greatest AutomatiCook



WHEN the new gas ranges reach you, look for the brand new, greatly improved Robertshaw "K" type AutomatiCook. Examine it. You'll find in the new AutomatiCook selling arguments that will make your ranges move faster.

Five new features—smaller, neater, more compact. There's a fully visible dial. There's a handsome chromium finish. There's a fool-proof One-Minute Temperature Check. A non-clog by-pass. And only *one* bolt holds the whole AutomatiCook to the range! Temperature setting, calibrating and all working parts accessible from outside the range.

We've prepared some descriptive literature of this new AutomatiCook. Write for it now. Study it before your ranges begin to arrive . . . . If you'll send us the names of your employees handling, selling or installing ranges, we'll be glad to send them literature to help sell ranges faster, too . . . Write—*today!*

ROBERTSHAW AutomatiCook

ROBERTSHAW THERMOSTAT COMPANY
Youngwood, Penna.

PLAY SAFE!

By Specifying and Using

"COLONIAL" BRAND

Re-Chrome Meter Leather

in your New Meters and Repair Work. This Leather will stand the Five-Minute Boiling Test.

This Trade Mark stamped on each New Zealand Lambskin is our guarantee to you that each skin has received the greatest care in its selection and tanning.

Besse, Osborn & Odell, Inc.

51 South Street, Boston 177 William St., N. Y.

Every One of Our Various Brands of

FIRE BRICK

is designed for a particular use. Consult our experts.

Marine XX 3-Star

Cascade Columbia

Pacific American

Lincoln

Plastic Fire Brick

Catalogue On Request

Gladding, McBean & Co.

SAN FRANCISCO, OAKLAND, FRESNO
LOS ANGELES, PORTLAND, SEATTLE
SPOKANE

NO-OX-ID IRON RUST

TRADE MARK

The Original Rust Preventive

The last word in pipe line protection.

DEARBORN CHEMICAL COMPANY
LOS ANGELES:
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252 Spear Street
Phone Davenport 658

DEARBORN CHEMICAL COMPANY
NO-OX-ID-IZED WRAPPER
NEW YORK TRADE MARK CHICAGO

VETERANS' HOSPITAL AT LITTLE ROCK ON "NATURAL"

Little Rock Gas and Fuel Co., Little Rock, Ark., has added the U. S. Veterans' Hospital at North Little Rock to its list of large consumers. The load is estimated at 70,000,000 cu. ft. annually.

The hospital consists of 38 separate buildings, all originally heated by individual coal units. Under supervision of Jacob Pyreh, superintendent of construction, U. S. Veterans' Bureau, buildings in the central area will be supplied with steam heat from two central heating units, one of which consists of one 105-h.p. and two 65-h.p. boilers; the other, two 155-h.p. boilers. Both units are equipped with Chaplin-Fulton boiler governors, Foxboro indicating, integrating, and recording meters and manometers. Nineteen buildings, such as personnel and staff quarters, lying outside of the two major areas, are equipped with individual control heating units, including modern automatic control.

AUTOMATIC GAS HEATING BURNER A NEW JOHNSON FEATURE

The new Johnson automatic gas heating burner is featured in an attractive pamphlet recently brought from the press by the Johnson Gas Appliance Co., Cedar Rapids, Iowa. The new burner was exhibited for the first time at the annual convention of the American Gas Association held at Atlantic City October 13 to 17.

New features, as announced by the company, are: Johnson direct jet gas orifice adjustment, large range and positive air adjustments, improved radiant heating features, compact assembly for speed and ease of installation, elimination of burner noises, complete automatic operation, positive safety pilot light.

CONTRACT FOR RED RIVER BRIDGE LET BY LONE STAR

The Lone Star Gas Company of Dallas, Texas, has let a contract for construction of a steel and concrete bridge across Red River in the Sivells Bend community.

Resting on two central piers, the bridge will be 1,200 feet long and will carry two natural gas pipe lines in order to remove them from the bed of the river.

Each of the piers will rise to a height of 80 feet above the surface of the river, while the floor level of the bridge will be 22 feet above the water line. Sixteen-inch pipe carrying 300 pounds pressure to the square inch will be used.

T. A. HOPKINS GENERAL MANAGER FOR SO. OREGON GAS CORP.

T. A. Hopkins, vice-president in charge of operations for the Southern Oregon Gas Corp., of Medford, Ore., has assumed the duties of general manager, following the death of W. W. Flanders, formerly holding that position. J. B. Brault has been named assistant general manager for the company.

BROWNWOOD FRANCHISE GIVEN TO NATURAL GAS AND FUEL

The Natural Gas and Fuel Co., of Brownwood, Texas, has been granted a 90-day franchise to install and operate a natural gas distribution system in Caldwell, Texas.

PERU, NEB., EXPECTING NATURAL GAS FOR WINTER USE

According to announcement made by C. P. Craft, the Nebraska Natural Gas Co., of Lincoln, Neb., expects to begin service at Peru, Neb., before the winter sets in.

HUNDREDS of OWNERS have ANSWERED these ADVERTISEMENTS

CLEAN EVEN HEAT that is 100% AUTOMATIC
YOU can always have exactly the temperature you desire in your home—and yet be free from furnace tending—if you install an Ideal Gas Boiler. It is entirely automatic and needs no attention from the beginning to the end of cold weather.
And you will have an extra, clean livable room in your basement. There is no soot, no dirt, no ash removal, no noise. And the fuel comes automatically from an inconspicuous pipe.
IDEAL GAS BOILERS
AUTOMATIC HEAT . . . with an EXTRA ROOM
THERE is an extra room in your home waiting for you to use. Your basement can become a livable room—suitable for a playroom, den, workshop, gymnasium or any other use.
There is no soot, no dirt, no fuel storage, no ash removal, no noise. Ideal Gas Boilers burn noiselessly, cleanly and efficiently. And they automatically keep your home at just the temperature desired without any attention from season's beginning to season's end.
IDEAL GAS BOILERS
Mail the coupon below for a free folder that will tell you all about Ideal Gas house heating.
GAS UTILIZATION DEPARTMENT
AMERICAN RADIATOR COMPANY
Division of
AMERICAN RADIATOR & STANDARD SANITARY CORPORATION
40 West 40th St., New York

are you getting your share of the profits?

★ Every day more and more people are answering the Ideal Gas Boiler advertisements that are appearing in 13 national magazines and the Pacific Coast Magazine, Sunset.

The gas companies that sell Ideal Gas Boilers are the ones that are enjoying the largest house heating load. They are taking advantage of the advertising, of the free merchandising helps and of the fact that the prestige of American Radiator Company is back of every Ideal Gas Boiler.

AMERICAN RADIATOR COMPANY

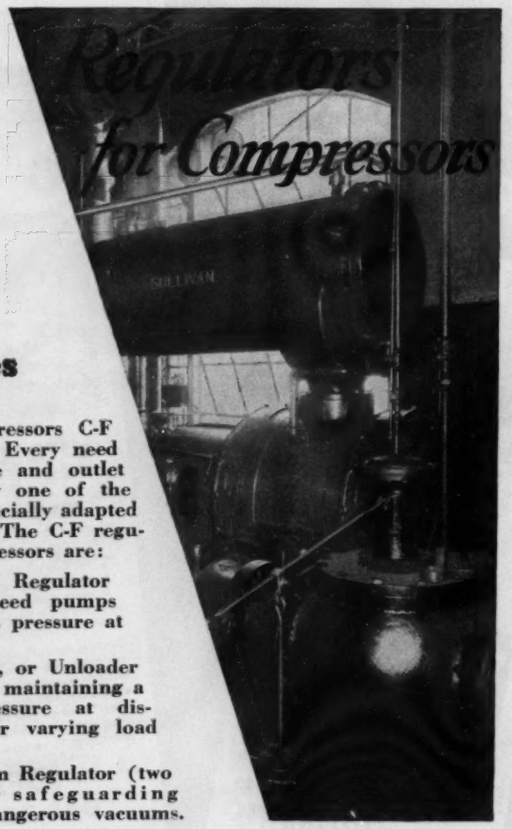
DIVISION OF

AMERICAN RADIATOR & STANDARD SANITARY CORPORATION

40 West 40th Street, New York City

C-F

Regulators for Compressors



give dependable regulation of suction and discharge pressures

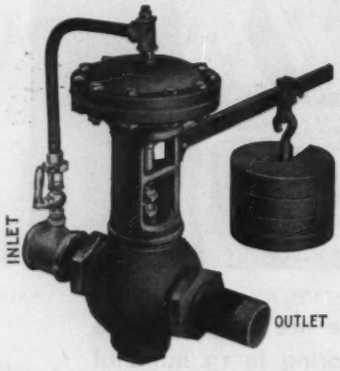
FOR gas or air compressors C-F Regulators are ideal. Every need for regulation on intake and outlet lines is provided for by one of the three C-F regulators especially adapted to compressor service. The C-F regulators used with compressors are:

(1) C-F Compressor Regulator for constant speed pumps to relieve excess pressure at the discharge.

(2) C-F Throttling, or Unloader Regulator for maintaining a constant pressure at discharge under varying load conditions.

(3) C-F Vacuum Regulator (two types) for safeguarding against dangerous vacuums.

Write for descriptive literature.



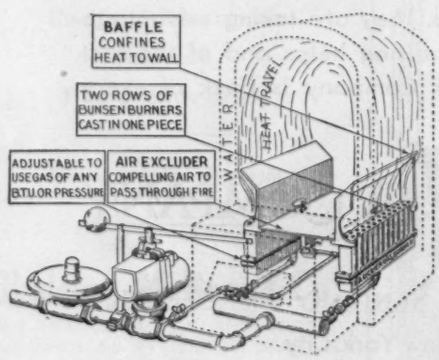
THE CHAPLIN-FULTON MFG. COMPANY

28-40 Penn Avenue Pittsburgh, Pa.

Organized 1884—Oldest Builders of Gas Regulators in the Country. Built in all Sizes from 1 Inch to 24 Inches; For All Service. 1 oz. up to 2,000 lbs. Pressure to Square Inch.

REPRESENTATIVES:
WESTCOTT & GREIS, Inc.
Sales and Service
Dallas — Los Angeles — Tulsa

JNO. W. CRAWFORD
Sales Engineer
1855 Industrial Street, Los Angeles
Or Any Jobber


BAFFLE CONFINES HEAT TO WALL
TWO ROWS OF BUNSEN BURNERS CAST IN ONE PIECE
ADJUSTABLE TO USE GAS OF ANY B.T.U. OR PRESSURE
AIR EXCLUDER COMPELLING AIR TO PASS THROUGH FIRE
WATER
HEAT TRAVEL

Perfect combustion correctly applied insures maximum efficiency

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K. L. SIMONS DIVISION MANAGER FOR UNITED GAS SERVICE

K. L. Simons, for 16 years vice-president and general manager of the El Paso Gas Company, now Texas Cities Gas Co., who left that organization last year to become vice-president and treasurer of Longwell Transfer Co., at El Paso, has left the border city to re-enter the gas industry as division manager for the United Gas Service Co., at New Braunfels, Texas.

FLOYD JOHNSON TO DIRECT NEW BUSINESS IN SEVEN TOWNS

Floyd A. Johnson, new business representative of the Western Distributing Co., El Dorado, Kan. has been transferred to Mulvane, Kan. and will have charge of the new business activities of the company in the towns of Mulvane, Oxford, Belle Plaine, Udall, Rose Hill, Derby and Douglass.

PHILLIPS PETROLEUM UTILITIES CO GETS IOWA FRANCHISES

The Phillips Petroleum Utilities was recently granted natural gas franchises in Stuart and Indianola, Iowa. The company also has a franchise in Winterset, Iowa.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC.,

Required by the Act of Congress of August 24, 1912, of *Western Gas*, published monthly, at Los Angeles, California, for October, 1930.

State of California,
County of Los Angeles—ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared James E. Jenkins, who, having been duly sworn according to law, deposes and says that he is the Secretary-Treasurer of the *Western Gas* and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:
Publisher—Jay Jenkins, Los Angeles, Calif.
Editor—None.
Managing Editor—Geo. H. Finley, Los Angeles, Calif.
Business Managers—None.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.)
Western Business Papers, Inc., Los Angeles, Calif.
Jay Jenkins, Los Angeles, Calif.
James E. Jenkins, Los Angeles, Calif.
Geo. H. Finley, Los Angeles, Calif.
Elliott Taylor, San Francisco, Calif.
Craig Espy, Dallas, Tex.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.)
None.

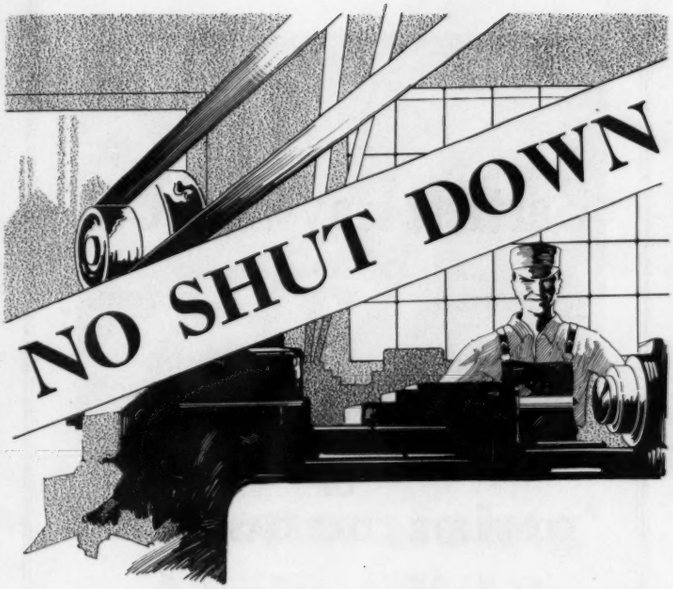
4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the six months preceding the date shown above is.....
(This information is required from daily publications only.)

JAMES E. JENKINS, Secretary.

Sworn to and subscribed before me this 23rd day of September, 1930.

(SEAL) (Signed) JOSEPHINE C. WHITING,
Notary Public.
(My commission expires March 25, 1932.)



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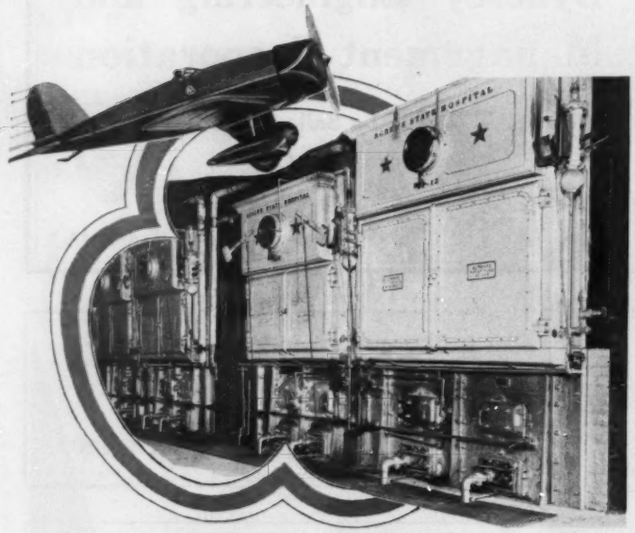

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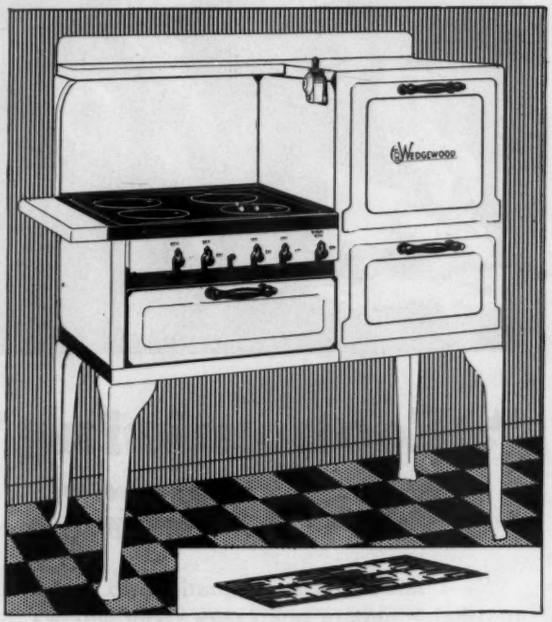

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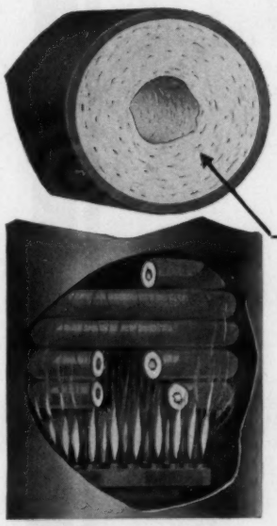

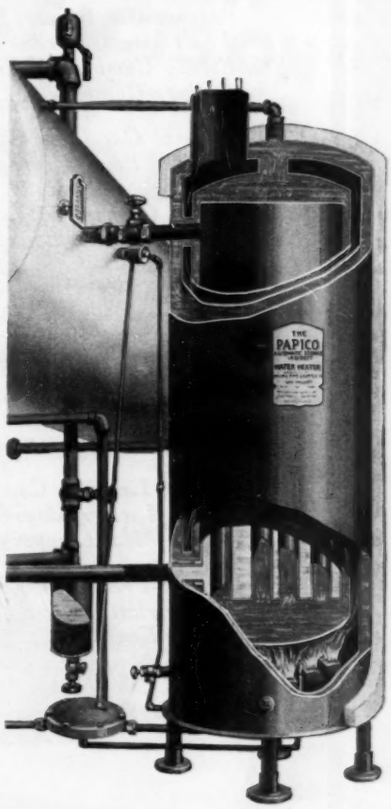

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Advertisers' Index

The A-B Stove Co. ... 72
American Gas Products Corp. ... 81
American Meter Company ... *2nd cover; 6*
American Radiator Company ... 91

Barber Gas Burner Co. ... *63-72*
The Bartlett Hayward Co. ... 94
Besse, Osborn & Odell, Inc. ... 90
The Bristol Company ... 9

J. A. Campbell Co. ... 82
The Chaplin-Fulton Mfg. Co. ... 92
Charter Gas Engine Co. ... 80
The Cleveland Trencher Company ... 68
James B. Clow & Sons ... —
The Cooper-Bessemer Corp. ... *Third Cover*

Darling Valve & Mfg. Co. ... 16
Dearborn Chemical Co. ... 90
Denver Fire Clay Co. ... 86
S. R. Dresser Mfg. Company ... 1
Ducommon Corporation ... 11

Electrogas Furnace Company ... 70
Electrolux Refrigerator Sales, Inc. ... 59

Faucher Gas Burner, Inc. ... 92
The Fisher Governor Co. ... 4
Forney Combustion Engr. Co. ... 78
Foxboro Company ... —

General Gas Light Company ... 67
General Paint Corp. ... 88
Gladding, McBean & Co. ... 90
James Graham Mfg. Co. ... 96
Groble Gas Regulator Company ... 66

Hammer-Bray Co. ... 97

Inertol Co., Inc. ... 68
Ingersoll-Rand Company ... —

Johnson Gas Appliance Co. ... 74

King Burner Company, Inc. ... 69

W. E. Lamneck Co. ... —
P. M. Lattner Mfg. Co. ... 76
Leahy Mfg. Company ... 93

Maxon-Premix Burner Co. ... 84
McEverlast, Inc. ... 19
Mears-Kane-Ofeldt ... 96
Merco Nordstrom Valve Co. ... *Front Cover*
Lee B. Mettler Co. ... 72
Minneapolis Honeywell Regulator Co. ... 83
Moore Brothers Company ... 57
Mueller Company ... —

The National Tube Co. ... 22
Natural Gas Equipment, Inc. ... 15
Naylor Pipe Company ... 12

Oklahoma Contracting Co. ... —

Pacific Gas and Electric Company ... 73
Pacific Gas Radiator Company ... 77
Pacific Pipe & Supply Co. ... 97
Pacific States Cast Iron Pipe Co. ... 95
Payne Furnace & Supply Company ... 85
Pittsburgh Equitable Meter Co. ... 8
Pittsburg Water Heater Co. ... 86
Plant Rubber & Asbestos Wks. ... 80

Refinery Supply Co. ... 88
Reliance Manufacturing Company ... 20
Republic Steel Corp. ... *17-18*
Reynolds Gas Regulator Company ... 84
Roberts-Gordon Appliance Corp. ... 79
Robertshaw Thermostat Company ... 89
Robinson Orifice Fitting Company ... —
Geo. D. Roper Corp. ... 61
Rotary Manufacturing Company ... 76
Ruud Mfg. Co. ... —

Safety Gas Main Stopper Company ... 78
A. O. Smith Corp. ... *2-3*
South Chester Tube Co. ... 68
Spencer Thermostat Co. ... 87
Sprague Meter Co. ... *Fourth Cover*
Standard Gas Equipment Co. ... 72
Standard Management & Operating Corp. ... 78
Surface Combustion Co. ... 95

The Tappan Stove Company ... 74
L. R. Teeple Company ... 75
Time-O-Stat Controls Company ... 71

United Engineers & Constructors ... 13
United States Pipe & Foundry Co. ... 5

Victaulic Company of America ... 14

Walmar Laboratory ... 76
Walworth Company ... 7
Webster Engineering Co. ... 94
Welsbach Co. ... 65
Westcott & Greis, Inc. ... 10
Westcott Valve Company ... —
The Wilcolater Company ... 88

John Zink Co. ... 68

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